

## INDEX OF REFRACTION TABLE

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Common objects Index Table	
Material	IOR Radio
Air	1,0003
Liquid carbon dioxide	1,2000
Ice	1,3090
Water (20 degrees)	1,3330
Acetone	1,3600
General alcohol	1,3600
30% of the sugar solution	1,3800
Alcohol	1,3290
Flour	1,4340
Melting quartz	1,4600
Calspar2	1,4860
80% of the sugar solution	1,4900
Glass	1,5000
Glass, zinc crown	1,5170
Glass crown	1,5200
NaCl	1,5300
Sodium chloride (salt)	1,5440
Polystyrene	1,5500
Quartz 2	1,5530

Feitsui	1,5700
Light flint	1,5750
Celestite	1,6100
Huang Jingbo	1,6100
CS2	1,6300
Quartz 1	1,6440
Sodium chloride (salt) 2	1,6440
Firestone heavy glass	1,6500
Isodiiodomethane	1,7400
Ruby	1,7700
Portland gem	1,7700
Extraordinarily flint	1,8900
Crystal	2,0000
Diamond	2,4170
Chromium oxide	2,7050
Copper Oxide	2,7050
Amorphous selenium	2,9200
Iodine crystals	3,3400

Common refractive index of optical glass and crystal table		
Names	Formula or symbol	Index
Fused silica	SiO <sub>2</sub>	1,4584
Sodium chloride	NaCl	1,5443

Potassium chloride	KCl	<b>1,4904</b>
Shi Ying	Numerically <sub>2</sub>	<b>1,4338</b>
Corona licensing glass	K6	<b>1,5111</b>
	K8	<b>1,5159</b>
	K9	<b>1,5163</b>
Corona heavy glass	ZK6	<b>1,6126</b>
	ZK8	<b>1,6140</b>
Corona barium glass	BaK2	<b>1,5399</b>
Flint	F1	<b>1,6033</b>
Firestone barium glass	BaF8	<b>1,6259</b>
Firestone heavy glass	ZF1	<b>1,6475</b>
	Auto	<b>1,7398</b>
	ZF6	<b>1,7550</b>

Table liquid refractive index				
Names	Formula	Density	Temperature °C	Index
Propanol	CH <sub>3</sub> COCH <sub>3</sub>	0,54930556	20	<b>1,359</b>
A	CH <sub>3</sub> OH	0,55138889	20	<b>1,329</b>
B	C <sub>2</sub> H <sub>5</sub> OH	0,55555556	20	<b>1,362</b>
Benzene	C <sub>6</sub> H <sub>6</sub>	1.880	20	<b>1,501</b>
CS2	CS <sub>2</sub>	1.263	20	<b>1,628</b>
Carbon tetrachloride	CCl <sub>4</sub>	1.591	20	<b>1,461</b>
Trichloromethane	CHCl <sub>3</sub>	1.489	20	<b>1,447</b>

Ether	$C_2H_5 \cdot Bolus_2H_5$	0,49652778	20	<b>1,354</b>
Glycerol	$C_3H_8O_3$	1.260	20	<b>1,473</b>
Turpentine		0,06041667	20.07	<b>1,472</b>
Olive oil		0,06388889	0	<b>1,476</b>
Water	$H_2O$	1.00	20	<b>1,333</b>

Crystal refractive index $n_o$ And $n_e$ Table			
Names	Formula	$N_o$	$N_e$
Ice	$H_2O$	<b>1,313</b>	<b>1,309</b>
MgF2	$MgF_2$	<b>1,378</b>	<b>1,39</b>
Quartz	$SiO_2$	<b>1,544</b>	<b>1,553</b>
Magnesium Chloride	$H MgO_2O$	<b>1,559</b>	<b>1,58</b>
Zircon	$ZrO_2_2 SiO_2$	<b>1,923</b>	<b>1,968</b>
ZnS	$ZnS$	<b>2,356</b>	<b>2,378</b>
Calcite	$CaO CO_2$	<b>1,658</b>	<b>1,486</b>
Calcium Shi Huang	$2CaO \cdot Al_2O_3 SiO_2$	<b>1,669</b>	<b>1,658</b>
Magnesite	$ZnO CO_2$	<b>1,7</b>	<b>1,509</b>
Shi Gang	$Al_2O_3$	<b>1,768</b>	<b>1,76</b>
Silvermine pink	$3Ag_2'S AS_2S_3$	<b>2,979</b>	<b>2,711</b>

Common to all Table object index	
Index Table	IOR Values
<i>Chinese</i>	<i>English</i>

Acetone 1.36	Acetone 1.36
Yang rock 1.618	Actinolite 1.618
Agate 1.544	Agate 1.544
Agate, Moss 1.540	Agate, Moss 1.540
Air 1.0002926	Air 1.0002926
Alcohol 1.329	Alcohol 1.329
Alexandrite 1.745	Alexandrite 1.745
Al - 1.44	Aluminum 1.44
Amber 1.546	Amber 1.546
161.1 lithium phosphate diaspore	Amblygonite 1.611
Favorites 1.544	Amethyst 1.544
Anatase 2.490	Anatase 2.490
Andalusite 1.641	Andalusite 1.641
Anhydrite 1.571	Anhydrite 1.571
Apatite 1.632	Apatite 1.632
Fish-eye stone 1.536	Apophyllite 1.536
Emeralds 1.577	Aquamarine 1.577
Aragonite aluminum	Aragonite aluminum
Argon 1.000281	Argon 1.000281
Asphalt drift	Asphalt drift
1.574 - quarrying	Augelite 1.574
Tomahawk Shi 1.675	Axinite 1.675
Blue Copper 1.730	Azurite 1.730

Barite 1.636	Barite 1.636
Shi-Ba-Ca 1.684 ramps	Barytocalcite 1.684
Blue cone 1.757	Benitoite 1.757
Benzene 1.501	Benzene 1.501
Green jade 1.577	Beryl 1.577
Phosphate (acid), sodium beryllium Shi 1.553	Beryllonite 1.553
Shi sodium aluminum phosphate, 1.603 Shi Silver Star	Brazilianite 1.603
Olfactory (liquid) 1.661	Bromine (liq) 1.661
Bronze 1.18	Bronze 1.18
Calcite 1.486	Calcite 1.486
Nepheline 1.491 Calcium	Cancrinite 1.491
CO2 (gas) 1.000449	Carbon Dioxide (gas) 1.000449
Carbon disulfide 1.628	Carbon Disulfide 1.628
Carbon tetrachloride 1.460	Carbon Tetrachloride 1.460
Cassiterite 1.997	Cassiterite 1.997
Celestite 1.622	Celestite 1.622
Belarus Lead 1.804	Cerussite 180.4
Rail magnesium spinel 1.770	Ceylanite 1.770
Chalcedony aluminum	Chalcedony aluminum
Cretaceous 1.510µm	Chalk 1.510µm
Mitsubishi 1.630 iron ball	Chalybite 1.630
Chlorine (gas) 1.000768	Chlorine (gas) 1.000768
Chlorine (liquid) 1.385	Chlorine (liq) 1.385

Chromium, Green 240	Chrome Green 240
Chromium, red 2.42	Chrome Red 2.42
Chrome yellow 2.31	Chrome Yellow 2.31
2.97 Cr	Chromium 2.97
The emeralds 1.745	Chrysoberyl 1.745
Blue Copper 1.500	Chrysocolla 1.500
Green chalcedony 1.534	Chrysoprase 1.534
Crystal 1.550 Huang	Citrine 1.550
Oblique epidote 1.724	Clinozoisite 1.724
Cobalt blue 1.74	Cobalt Blue 1.74
Cobalt, 197 Green	Cobalt Green 197
Cobalt, purple 1.71	Cobalt Violet 1.71
Sit stiffly in calcium stone 1.586	Colemanite 1.586
Copper 1.10	Copper 1.10
Copper Oxide 2.705	Copper Oxide 2.705
Coral 1.486	Coral 1.486
Cordierite 1.540	Cordierite 1.540
Corundum 1.766	Performance 1.766
Lead 2.310 Chek	Crocoite 2.310
Crystal 2.00	Crystal 2.00
Akagane 2.850	Cuprite 2.850
Structure metals 1.633	Danburite 1.633
Diamond 2.417	Diamond 2.417

Diopside 1.680	Diopside 1.680
Dolomite 1.503	Dolomite 1.503
Shi 1.686 Blue Line	Dumortierite 1.686
1.66 hardening rubber	Ebonite 1.66
CaSi uranium and thorium 1.600	Ekanite 1.600
Resin-stone 1.532	Elaeolite 1.532
Jade 1.576	Emerald 1.576
Jade, synthesis melting 1.561	Emerald, Synthèse flux 1.561
Jade, synthesis spa 1.568	Emerald, Synthèse hydro 1.568
1.663 stubborn pyroxene	Enstatite 1.663
Epidote 1.733	Epidote 1.733
Ethanol 1.36	Ethanol 1.36
1.36 ordinary alcohol	1.36 Ethyl Alcohol
Blue pillar 1.652	Euclase 1.652
Shi, sand, stone 1.532	Feldspar, Adventurine 1.532
Shi, Shi Na 1.525	Feldspar, Albite 1.525
Shi, Shi 1.525 Tianhe	Feldspar, Amazonite 1.525
Shi, Shi 1.565 flash drawl	Feldspar, Labradorite 1.565
Shi, Shi 1.525 micro-ramp	Feldspar, Microcline 1.525
Shi, Secretary General Shi 1.539	Feldspar, Oligoclase 1.539
Shi, Shi is 1.525	Feldspar, orthoclase 1.525
Fluoride 1.56	Fluoride 1.56
Fluorite 1.434	Fluorite 1.434



Fumika plastic veneer furniture 1.47	Formica 1.47
Garnet, aluminum leucite 1.760	Garnet, Almandine 1.760
Garnet, aluminum leucite 1.790	Garnet, Almandite 1.790
Garnet, Wei-quan 1.820	Garnet, Andradite 1.820
Garnet, C.C.Milisenda 1.880	Garnet, Demantoid 1.880
Garnet, aluminum calcium leucite 1.738	Garnet, Grossular 1.738
Garnet, cinnamon Shi 1.745	Garnet, Hessonite 1.745
Garnet red leucite 1.760	Garnet, Rhodolite 1.760
Garnet, aluminum leucite 1.810 Mn	Garnet, Spessartite 1.810
Shi Na +-Ca2 + 1.517 monoclinic	Gaylussite 1.517
Glass 1.51714	Glass 1.51714
Glass, sodium feldspar 1.4890	Glass, Albite 1.4890
Glass canopy 1.520	Glass Crown 1.520
Glass, crown, zinc 1.517	Glass, Crown, Zinc 1.517
Glass and play quickly, intensive 1.66	Glass, Flint, Dense 1.66
Glass and play quickly, re - 1.89	Glass, Flint, Heaviest 1.89
Glass and play quickly, heavy 1.65548	Glass, Flint, Heavy 1.65548
Glass, fighting quickly, La 1.80	Glass, Flint, Lanthanum 1.80
Glass and play quickly, light 1.58038	Glass, Flint, Light 1.58038
Glass, fighting quickly, medium 1.62725	Glass, Flint, Medium 1.62725
Glycerin 1.473	Glycerine 1.473
Gold 0.47	Gold 0.47
B, Be 1.559 Shi	Hambergite 1.559

Blues Shi 1.502	Hauynite 1.502
He 1.000036	Helium 1.000036
Rail line 2.940	Hematite 2.940
Very different 1.614	Hemimorphite 1.614
Shi 1.655 hidden	Hiddenite 1.655
Silicon boron-calcium stone 1.586	Howlite 1.586
Hydrogen (gas) 1.000140	Hydrogen (gas) 1.000140
Hydrogen (liquid) 1.0974	Hydrogen (liq) 1.0974
Hyperthene -1.670	Hypersthene -1.670
Ice 1.309	Ice 1.309
Vesuvianite 1.713	Idocrase 1.713
Crystal iodine 334	Iodine 334 Crystal
Cordierite 1.548	Iolite 1.548
Rail 1.51	Iron 1.51
Ivory 1.540	Ivory 1.540
Jade, nephrite jade 1.610	Jade, Nephrite 1.610
166.5 jade stone	Jadeite 1.665
Bi 1.540	TMJ 1.540
Black-1.660	Jet 1.660
166.5 - omphacite	Kornerupine 1.665
Purple $\beta$ - spodumene 1.655	Kunzite 1.655
Kyanite 1.715	Kyanite 1.715
Germany 1.500 LAZURITE	Lapis Gem 1.500

Sapphire 1.61	Lapis Lazuli 1.61
Seals Shi 161.5	Lazulite 161.5
Lead 2.01	Lead 2.01
150.9 leucite	Leucite 1.509
Magnesite 151.5	Magnesite 151.5
Malachite 1.655	Malachite 1.655
Sepiolite aluminum	Changing - in-acid of Meerschaum aluminum
Mercury (liquid) 1.62	Mercury (liq) 1.62
Methanol 1.329	Methanol 1.329
Green glassy meteorite 1.500	Moldavite 1.500
On Shi, Shi Bing 1.525	Moonstone, Adularia 1.525
On Shi, Shi Na 1.535	Moonstone, Albite 1.535
Natrolite 1.480	Natrolite 1.480
Nephrite 1.600	Nephrite 1.600
Nitrogen (gas) 1.000297	Nitrogen (gas) 1.000297
Nitrogen (liquid) 1.2053	Nitrogen (liq) 1.2053
Nylon 1.53	Nylon 1.53
Obsidian 1.489	Obsidian 1.489
Olivine -1.670	Olivine -1.670
Ma ho brain 1.486	Onyx 3 1.486
Opal 1.450	Opal 1.450
Oxygen (gas) 1.000276	Oxygen (gas) 1.000276
Oxygen (liquid) 1.221	Oxygen (liq) 1.221

Red 178.7 silicon boron hibonite	Painite 1.787
Pearl aluminum	Pearl aluminum
Periclase 1.740	Periclase 1.740
Olivine 1.654	Peridot 1.654
Blue color 1.525 sodium feldspar	Peristerite 1.525
Said Li Shi 1.502	Petalite 1.502
Si Shi 1.650 Beryllium	Phenakite 1.650
Kok Galena 2.117	Phosgenite 2.117
Plastic 1.460	Plastic 1.460
Puliekesi glass 1.50	Plexiglas 1.50
PS 155	Polystyrene 1.55
Green quartz 1.540	Prase 1.540
堇 block chlorite 1.540	Prasiolite 1.540
Shi 1.610 grapes	Prehnite 1.610
Silvermine 2.790 pink	Proustite 2.790
Purple phosphorus iron manganese 1.840	Purpurite 1.840
Pyrite 1.810	Pyrite 1.810
Shi 1.740 Mg	Pyrope 1.740
Quartz 1.544	Quartz 1.544
Quartz, melt 1.45843	Quartz, Fused 1.45843
Boron, lithium and beryllium ore 1.690	Rhodizite 1.690
Rosa pyroxene 1.735	Rhodonite 1.735
Rock salt 1.544	Rock Salt 1.544

Rubber, red 1.5191	Rubber, Natural 1.5191
Ruby 1.760	Ruby 1.760
Rutile 2.62	Rutile 2.62
Shi said 1.522	Sanidine 1.522
Sapphire 1.760	Sapphire 1.760
Scapolite 1.540	Scapolite 1.540
Scapolite yellow 1.555	Scapolite, Yellow 1.555
Witherite 1.920	Scheelite 1.920
Selenium, amorphous 2.92	Selenium, Amorphous 2.92
Serpentine jade 1.560	Serpentine 1.560
Aluminum shell	Shell aluminum
Si 4.24	Silicon 4.24
Si Shi line 1.658	Sillimanite 1.658
Silver 0.18	Silver 0.18
Al-Mg Point B 1.699	Sinhalite 1.699
Green amphibole 1.608	Smaragdite 1.608
Mitsubishi Zinc 1.621	Smithsonite 1.621
Sodalite 1.483	Sodalite 1.483
NaCl 1.544	Sodium Chloride 1.544
Flash 236.8 Zinc	Sphalerite 236.8
Sphene 1.885	Sphene 1.885
Spinel 1.712	Spinel 1.712
B - spodumene 1.650	Spodumene 1.650

Staurolite 1.739	Staurolite 1.739
Shi 1.539 freeze	Steatite 1.539
Steel 2.50	Steel 2.50
Chromium 1.520 hydrotalcite	Stichtite 1.520
2.410 strontium titanate	Strontium Titanate 2.410
Polyphenylene B 1.595	Styrofoam 1.595
Sulfur 1.960	Sulfur 1.960
1.730 artificial spinel	Synthetic Spinel 1.730
Beryllium magnesium quartz à	Taaffeite à
Tantalum Rail 2.240	Tantalite 2.240
Tanzania black epidote 1.691	Tanzanite 1.691
Teflon 1.35	Teflon 1.35
Zeolite aluminum pole	Thomsonite aluminum
Tiger eyes glaze 1.544	Tiger eye 1.544
Metals 1.620	Topaz 1.620
Huang Jingbo, blue 1.610	Topaz, Blue 1.610
Huang Jingbo, pink 1.620	Topaz, Pink 1.620
Huang Jingbo, white 1.630	Topaz, White 1.630
Huang Jingbo, yellow 1.620	Topaz, Yellow 1.620
Tourmaline 1.624	Tourmaline 1.624
Tremolite 1.600	Tremolite 1.600
Shi unpaid sodium aluminum silicon beryllium	Tugtupite unpaid
Turpentine 1.472	Turpentine 1.472

Turkey-1.610	Turquoise 1.610
Boron sodium and calcium stone surcharges	Ulexite surcharges
Uvarovite 1.870	Uvarovite 1.870
P diaspore 1.550	Variscite 1.550
Blue iron 1.580	Vivianite 1.580
Shi 1.590 sodium aluminum phosphate water	Wardite 1.590
Water (gas) 1.000261	Water (gas) 1.000261
Irrigating 100 'C 1.31819	Water 100 'C 1.31819
Irrigating 20 'C 1.33335	Water 20 'C 1.33335
Irrigating 35 'C (room temperature) 1.33157	Water 35 'C (Room température) 1.33157
Zinc silicate 1.690	Willemite 1.690
Witherite 1.532	Witherite 1.532
Galena 2.300 Mo	Wulfenite 2.300
Red Zinc 2.010	Zincite 2.010
Zircon, high 1.960	Zircon, High 1.960
Zircon, low utility	Zircon, Low helicopters
Zirconia, cube 2.170	Zirconia, Cubic 2.170

## Refractive index and extinction coefficient of materials

**Note:** The extinction coefficient is related to the absorption coefficient by  $\alpha = 4 \pi \bar{k} / \lambda_0$ , where  $\alpha$  is the absorption coefficient,  $\bar{k}$  is the extinction coefficient, and  $\lambda_0$  is the wavelength in vacuum.

### Acrylic

Wavelength $\lambda$ (nm)	Refractive index $n$ (-)
370	1.51259
380	1.51066
390	1.50891
400	1.50731
410	1.50584
420	1.50449
430	1.50324
440	1.50209
450	1.50102
460	1.50004
470	1.49911
480	1.49826
490	1.49746
500	1.49671
510	1.496
520	1.49534
530	1.49472
540	1.49413
550	1.49358
560	1.49306
570	1.49256
580	1.4921
590	1.49165
600	1.49123
610	1.49083
620	1.49044
630	1.49008
640	1.48973
650	1.4894
660	1.48908
670	1.48878
680	1.48849
690	1.48821
700	1.48795
710	1.48769
720	1.48745
730	1.48721
740	1.48699
750	1.48677
760	1.48656
770	1.48636
780	1.48617
790	1.48598
800	1.4858
810	1.48563
820	1.48546
830	1.4853
840	1.48515
850	1.485
860	1.48485



870	1.48471
880	1.48457
890	1.48444
900	1.48432
910	1.48419
920	1.48407
930	1.48396
940	1.48385
950	1.48374
960	1.48363
970	1.48353
980	1.48343
990	1.48333
1000	1.48324
1010	1.48315
1020	1.48306
1030	1.48298
1040	1.48289
1050	1.48281
1060	1.48273
1070	1.48266
1080	1.48258
1090	1.48251
1100	1.48244

**Ag (Silver) (note that there are two consecutive sets of data)**

Wavelength $\lambda$ (nm)	Refractive index $n$ (-)
210.1356	1.19
213.7586	1.21
217.5088	1.23
221.3929	1.25
225.4182	1.26
229.5926	1.27
233.9245	1.28
238.4231	1.28
243.098	1.3
247.96	1.31
253.0204	1.32
258.2917	1.34
263.7872	1.36
269.5217	1.38
275.5111	1.41
281.7727	1.41
288.3256	1.4
295.1905	1.38
302.3902	1.32
309.95	1.15
317.8974	.91
326.2632	.44
335.0811	.13
344.3889	.13
354.2285	.1
364.6471	.08
375.697	.06
387.4375	.05
399.9355	.05
413.2667	.05
427.5172	.04
442.7857	.04
459.1852	.04

476.8461	.05
495.92	.05
516.5833	.05
539.0435	.06
563.5454	.06
590.3809	.05
619.9	.06
652.5263	.05
688.7778	.04
729.2941	.03
774.875	.03
826.5333	.04
885.5714	.04
953.6923	.04
1033.167	.04
1127.091	.05
1239.8	.1

Wavelength $\lambda$ (nm)	Extinction coefficient $k$ (-)
206.63333	1.31
210.13559	1.32
213.75862	1.33
217.50877	1.338
221.39285	1.342
225.41818	1.343
229.59259	1.352
233.92452	1.362
238.42307	1.37
243.09803	1.379
247.96	1.388
253.0204	1.393
258.29166	1.391
263.78723	1.384
269.52173	1.37
275.51111	1.335
281.77272	1.289
288.32558	1.221
295.19047	1.107
302.39024	0.913
309.94999	0.642
317.89743	0.412
326.26315	0.591
335.08107	0.94
344.38888	1.191
354.22856	1.419
364.64705	1.605
375.69696	1.78
387.43749	1.944
399.93548	2.104
413.26666	2.275
427.51723	2.432
442.78571	2.58
459.18518	2.744
476.84614	2.92
495.91999	3.093
516.58332	3.284
539.04347	3.498
563.54544	3.709
590.38094	3.929
619.89999	4.177

652.5263	4.43
688.77776	4.714
729.2941	5.034
774.87499	5.381
826.53332	5.772
885.57141	6.26
953.69229	6.769
1033.16665	7.369
1127.09089	8.118
1239.79998	9.001

#### **Ag (Silver)**

**Data from “Handbook of Optical Constant of Solids” by Edward Palik (1985)**

**Measurements of the reflectivity of evaporated Ag films by Hong Luo and Yun-Li Li revealed that the Palik data gave the best agreement with experimental results.**

Wavelength $\lambda$ (nm)	Refractive Index $n$ (-)
206.6	1.125
213.8	1.173
221.4	1.208
229.6	1.238
238.4	1.265
248.0	1.298
253.0	1.320
258.3	1.343
263.8	1.372
269.5	1.404
275.5	1.441
281.8	1.476
288.3	1.502
295.2	1.519
298.8	1.522
302.4	1.496
306.1	1.432
310.0	1.323
311.5	1.246
313.9	1.149
315.5	1.044
317.9	0.932
319.5	0.815
322.0	0.708
323.7	0.616
326.3	0.526
330.6	0.371
332.4	0.321
335.1	0.294
339.7	0.259
344.4	0.238
354.2	0.209
364.7	0.186
375.7	0.200
387.5	0.192
400.0	0.173
413.3	0.173
427.5	0.160
442.8	0.157
459.2	0.144
476.9	0.132
495.9	0.130
516.6	0.130
539.1	0.129

563.6	0.120
590.4	0.121
619.6	0.131
652.6	0.140
688.8	0.140
729.3	0.148
774.9	0.143
826.6	0.145
885.6	0.163
953.7	0.198
1033	0.226
1127	0.251
1240	0.329

Wavelength $\lambda$ (nm)	Refractive Index $k$ (-)
206.6	1.27
213.8	1.29
221.4	1.30
229.6	1.31
238.4	1.33
248.0	1.35
253.0	1.35
258.3	1.35
263.8	1.35
269.5	1.33
275.5	1.31
281.8	1.26
288.3	1.19
295.2	1.08
298.8	0.992
302.4	0.882
306.1	0.766
310.0	0.647
311.5	0.586
313.9	0.540
315.5	0.514
317.9	0.504
319.5	0.526
322.0	0.565
323.7	0.609
326.3	0.663
330.6	0.813
332.4	0.902
335.1	0.986
339.7	1.12
344.4	1.24
354.2	1.44
364.7	1.61
375.7	1.67
387.5	1.81
400.0	1.95
413.3	2.11
427.5	2.26
442.8	2.40
459.2	2.56
476.9	2.72
495.9	2.88
516.6	3.07
539.1	3.25
563.6	3.45

590.4	3.66
619.6	3.88
652.6	4.15
688.8	4.44
729.3	1.74
774.9	5.09
826.6	5.50
885.6	5.95
953.7	6.43
1033	6.99
1127	7.67
1240	8.49

#### **Al (Aluminum)**

Wavelength $\lambda$ (nm)	Refractive index $n$ (-)
364.6471	.407
375.697	.432
387.4375	.46
399.9355	.49
413.2667	.523
427.5172	.558
442.7857	.598
459.1852	.644
476.8461	.695
495.92	.755
516.5833	.826
539.0435	.912
563.5454	1.02
590.3809	1.15
619.9	1.3
652.5263	1.49
688.7778	1.74
729.2941	2.14
774.875	2.63
826.5333	2.74
885.5714	2.24
953.6923	1.47
1033.167	1.26
1127.091	1.2
1239.8	1.21
1377.556	1.26
1549.75	1.44
1771.143	1.77

Wavelength $\lambda$ (nm)	Extinction coefficient $k$ (-)
364.65	4.43
375.70	4.56
387.44	4.71
399.94	4.86
413.27	5.02
427.52	5.2
442.79	5.38
459.19	5.28
476.85	5.8
495.92	6.03
516.58	6.28
539.04	6.55
563.55	6.85
590.38	7.15

619.90	7.48
652.53	7.82
688.78	8.21
729.29	8.57
774.87	8.6
826.53	8.31
885.57	8.21
953.69	8.95
1033.17	12
1127.09	11.2
1239.80	12.5
1377.56	14
1549.75	16
1771.14	18.3

#### **Al<sub>10</sub>Ga<sub>90</sub>As (AlGaAs)**

Wavelength $\lambda$ (nm)	Refractive index $n$ (-)
206.7	1.311
210.2	1.318
213.8	1.330
217.5	1.345
221.4	1.371
225.5	1.408
229.6	1.459
234.0	1.531
238.5	1.634
243.1	1.819
248.0	2.207
253.1	2.772
258.3	3.267
263.8	3.611
270.0	3.829
275.6	4.010
281.8	4.017
288.4	3.922
295.2	3.801
302.4	3.697
310	3.618
317.9	3.566
326.3	3.537
335.1	3.532
344.4	3.552
354.3	3.601
364.7	3.690
375.8	3.864
387.5	4.253
400	4.460
413.3	4.838
427.6	4.968
442.9	4.725
459.3	4.518
476.9	4.353
496	4.220
516.7	4.111
539.1	4.018
563.6	3.940
590.5	3.876
620.0	3.820
652.6	3.775
688.9	3.716

729.4	3.678
775.0	3.661
826.7	3.572
885.7	3.530
953.8	3.484
1033.3	3.452
1127.3	3.428
1240	3.410
1377.8	3.395
1550	3.383
1771.4	3.374
2066.7	3.366

Wavelength $\lambda$ (nm)	Extinction coefficient $k$ (-)
206.7	2.457
210.2	2.538
213.8	2.608
217.5	2.698
221.4	2.800
225.5	2.921
229.6	3.059
234.0	3.223
238.5	3.433
243.1	3.704
248.0	3.983
253.1	4.036
258.3	3.846
263.8	3.536
270.0	3.229
275.6	2.876
281.8	2.507
288.4	2.240
295.2	2.074
302.4	1.983
310	1.937
317.9	1.920
326.3	1.924
335.1	1.945
344.4	1.979
354.3	2.030
364.7	2.100
375.8	2.203
387.5	2.187
400	1.949
413.3	1.836
427.6	1.126
442.9	0.763
459.3	0.575
476.9	0.462
496	0.382
516.7	0.320
539.1	0.276
563.6	0.237
590.5	0.199
620.0	0.171
652.6	0.127
688.9	0.099
729.4	0.082
775.0	0.059
826.7	0

885.7	0
953.8	0
1033.3	0
1127.3	0
1240	0
1377.8	0
1550	0
1771.4	0
2066.7	0

#### **Al<sub>20</sub>Ga<sub>80</sub>As (AlGaAs)**

Wavelength $\lambda$ (nm)	Refractive index $n$ (-)
206.7	1.333
210.2	1.339
213.8	1.349
217.5	1.366
221.4	1.393
225.5	1.433
229.6	1.490
234.0	1.567
238.5	1.677
243.1	1.860
248.0	2.210
253.1	2.734
258.3	3.238
263.8	3.638
270.0	3.924
275.6	4.053
281.8	4.018
288.4	3.911
295.2	3.795
302.4	3.701
310	3.633
317.9	3.588
326.3	3.568
335.1	3.572
344.4	3.602
354.3	3.668
364.7	3.792
375.8	4.084
387.5	4.379
400	4.607
413.3	4.943
427.6	4.757
442.9	4.547
459.3	4.375
476.9	4.235
496	4.118
516.7	4.022
539.1	3.940
563.6	3.871
590.5	3.815
620.0	3.759
652.6	3.700
688.9	3.662
729.4	3.635
775.0	3.536
826.7	3.457
885.7	3.465



953.8	3.429
1033.3	3.401
1127.3	3.379
1240	3.361
1377.8	3.346
1550	3.334
1771.4	3.324
2066.7	3.316

Wavelength $\lambda$ (nm)	Extinction coefficient $k$ (-)
206.7	2.457
210.2	2.531
213.8	2.600
217.5	2.688
221.4	2.794
225.5	2.912
229.6	3.049
234.0	3.208
238.5	3.407
243.1	3.654
248.0	3.914
253.1	3.997
258.3	3.867
263.8	3.575
270.0	3.223
275.6	2.803
281.8	2.449
288.4	2.206
295.2	2.059
302.4	1.976
310	1.933
317.9	1.917
326.3	1.922
335.1	1.942
344.4	1.979
354.3	2.034
364.7	2.115
375.8	2.180
387.5	1.978
400	1.857
413.3	1.322
427.6	0.865
442.9	0.636
459.3	0.500
476.9	0.409
496	0.341
516.7	0.288
539.1	0.242
563.6	0.202
590.5	0.165
620.0	0.118
652.6	0.094
688.9	0.082
729.4	0.020
775.0	0.002
826.7	0
885.7	0
953.8	0
1033.3	0
1127.3	0

1240	0
1377.8	0
1550	0
1771.4	0
2066.7	0

### **Al<sub>2</sub>O<sub>3</sub> (Alumina)**

Wavelength  $\lambda$  (nm)      Refractive index  $n$  (-)

260	1.824
280	1.815
300	1.808
320	1.802
340	1.797
360	1.793
380	1.789
400	1.786
420	1.784
440	1.781
460	1.779
480	1.777
500	1.775
520	1.774
540	1.772
560	1.771
580	1.77
600	1.768
620	1.767
640	1.766
660	1.765
680	1.765
700	1.764
720	1.763
740	1.762
760	1.762
780	1.761
800	1.76
820	1.76
840	1.759
860	1.759
880	1.758
900	1.758
1033	1.755

Wavelength  $\lambda$  (nm)      Extinction coefficient  $k$  (-)

260	0
280	0
300	0
320	0
340	0
360	0
380	0
400	0
420	0
440	0
460	0
480	0
500	0
520	0
540	0

560	0
580	0
600	0
620	0
640	0
660	0
680	0
700	0
720	0
740	0
760	0
780	0
800	0
820	0
840	0
860	0
880	0
900	0
1033	0

#### **Al<sub>30</sub>Ga<sub>70</sub>N (AlGa<sub>N</sub>)**

Wavelength $\lambda$ (nm)	Refractive index $n$ (-)
310.0	2.557
354.29	2.36
413.33	2.27
496.0	2.22
620.0	2.18
826.67	2.156
1240.0	2.14

Wavelength $\lambda$ (nm)	Extinction coefficient $k$ (-)
225.45	0.4126
248.0	0.345
275.56	0.289
310.0	0.007
354.29	0
413.33	0
496.0	0
620.0	0
826.67	0
1240.0	0

#### **Al<sub>32</sub>Ga<sub>68</sub>As (AlGaAs)**

Wavelength $\lambda$ (nm)	Refractive index $n$ (-)
206.7	1.347
210.2	1.338
213.8	1.352
217.5	1.367
221.4	1.393
225.5	1.437
229.6	1.497
234.0	1.581
238.5	1.696
243.1	1.878
248.0	2.198
253.1	2.684
258.3	3.196
263.8	3.669

270.0	3.982
275.6	4.062
281.8	3.999
288.4	3.883
295.2	3.772
302.4	3.686
310	3.625
317.9	3.588
326.3	3.575
335.1	3.589
344.4	3.633
354.3	3.724
364.7	3.922
375.8	4.246
387.5	4.456
400	4.825
413.3	4.781
427.6	4.582
442.9	4.404
459.3	4.258
476.9	4.135
496	4.032
516.7	3.945
539.1	3.872
563.6	3.815
590.5	3.750
620.0	3.690
652.6	3.650
688.9	3.592
729.4	3.509
775.0	3.456
826.7	3.404
885.7	3.394
953.8	3.363
1033.3	3.338
1127.3	3.317
1240	3.300
1377.8	3.285
1550	3.273
1771.4	3.263
2066.7	3.254

Wavelength $\lambda$ (nm)	Extinction coefficient $k$ (-)
206.7	2.443
210.2	2.502
213.8	2.577
217.5	2.669
221.4	2.776
225.5	2.893
229.6	3.030
234.0	3.187
238.5	3.376
243.1	3.604
248.0	3.845
253.1	3.957
258.3	3.881
263.8	3.617
270.0	3.177
275.6	2.733
281.8	2.393

288.4	2.172
295.2	2.040
302.4	1.966
310	1.927
317.9	1.914
326.3	1.921
335.1	1.946
344.4	1.988
354.3	2.054
364.7	2.134
375.8	2.041
387.5	1.879
400	1.558
413.3	1.012
427.6	0.722
442.9	0.556
459.3	0.446
476.9	0.367
496	0.305
516.7	0.258
539.1	0.227
563.6	0.202
590.5	0.167
620.0	0.145
652.6	0.111
688.9	0.008
729.4	0
775.0	0
826.7	0
885.7	0
953.8	0
1033.3	0
1127.3	0
1240	0
1377.8	0
1550	0
1771.4	0
2066.7	0

#### **Al<sub>42</sub>Ga<sub>58</sub>As (AlGaAs)**

Wavelength $\lambda$ (nm)	Refractive index $n$ (-)
206.7	1.353
210.2	1.350
213.8	1.357
217.5	1.377
221.4	1.406
225.5	1.456
229.6	1.523
234.0	1.613
238.5	1.740
243.1	1.926
248.0	2.234
253.1	2.695
258.3	3.200
263.8	3.733
270.0	4.054
275.6	4.103
281.8	4.014
288.4	3.897
295.2	3.794

302.4	3.719
310	3.667
317.9	3.640
326.3	3.640
335.1	3.668
344.4	3.736
354.3	3.887
364.7	4.172
375.8	4.401
387.5	4.706
400	4.778
413.3	4.605
427.6	4.430
442.9	4.280
459.3	4.154
476.9	4.047
496	3.957
516.7	3.881
539.1	3.820
563.6	3.747
590.5	3.686
620.0	3.664
652.6	3.559
688.9	3.479
729.4	3.422
775.0	3.378
826.7	3.341
885.7	3.332
953.8	3.304
1033.3	3.280
1127.3	3.260
1240	3.243
1377.8	3.229
1550	3.216
1771.4	3.206
2066.7	3.198

Wavelength $\lambda$ (nm)	Extinction coefficient $k$ (-)
206.7	2.440
210.2	2.507
213.8	2.574
217.5	2.675
221.4	2.783
225.5	2.908
229.6	3.047
234.0	3.201
238.5	3.384
243.1	3.598
248.0	3.822
253.1	3.937
258.3	3.909
263.8	3.646
270.0	3.157
275.6	2.691
281.8	2.363
288.4	2.161
295.2	2.040
302.4	1.971
310	1.936
317.9	1.924

326.3	1.931
335.1	1.958
344.4	2.005
354.3	2.071
364.7	2.042
375.8	1.870
387.5	1.640
400	1.119
413.3	0.786
427.6	0.596
442.9	0.472
459.3	0.385
476.9	0.319
496	0.268
516.7	0.219
539.1	0.178
563.6	0.134
590.5	0.100
620.0	0.059
652.6	0.003
688.9	0
729.4	0
775.0	0
826.7	0
885.7	0
953.8	0
1033.3	0
1127.3	0
1240	0
1377.8	0
1550	0
1771.4	0
2066.7	0

#### **Al<sub>49</sub>Ga<sub>51</sub>As (AlGaAs)**

Wavelength $\lambda$ (nm)	Refractive index $n$ (-)
206.7	1.366
210.2	1.363
213.8	1.364
217.5	1.379
221.4	1.412
225.5	1.462
229.6	1.532
234.0	1.632
238.5	1.763
243.1	1.951
248.0	2.250
253.1	2.686
258.3	3.187
263.8	3.731
270.0	4.072
275.6	4.107
281.8	4.009
288.4	3.894
295.2	3.798
302.4	3.730
310	3.688
317.9	3.671
326.3	3.680
335.1	3.724

344.4	3.822
354.3	4.034
364.7	4.294
375.8	4.525
387.5	4.753
400	4.654
413.3	4.483
427.6	4.328
442.9	4.195
459.3	4.081
476.9	3.985
496	3.903
516.7	3.838
539.1	3.761
563.6	3.696
590.5	3.665
620.0	3.558
652.6	3.477
688.9	3.417
729.4	3.368
775.0	3.329
826.7	3.283
885.7	3.288
953.8	3.261
1033.3	3.238
1127.3	3.219
1240	3.202
1377.8	3.188
1550	3.176
1771.4	3.166
2066.7	3.157

Wavelength $\lambda$ (nm)	Extinction coefficient $k$ (-)
206.7	2.418
210.2	2.49
213.8	2.572
217.5	2.666
221.4	2.78
225.5	2.903
229.6	3.045
234	3.199
238.5	3.378
243.1	3.579
248	3.787
253.1	3.904
258.3	3.899
263.8	3.645
270	3.147
275.6	2.668
281.8	2.351
288.4	2.159
295.2	2.046
302.4	1.98
310	1.945
317.9	1.933
326.3	1.942
335.1	1.969
344.4	2.017
354.3	2.049
364.7	1.922



375.8	1.748
387.5	1.34
400	.926
413.3	.684
427.6	.534
442.9	.429
459.3	.355
476.9	.292
496	.245
516.7	.205
539.1	.164
563.6	.133
590.5	.088
620	.002
652.6	0
688.9	0
729.4	0
775	0
826.7	0
885.7	0
953.8	0
1033.3	0
1127.3	0
1240	0
1377.8	0
1550	0
1771.4	0
2066.7	0

#### **Al<sub>59</sub>Ga<sub>41</sub>As (AlGaAs)**

Wavelength $\lambda$ (nm)	Refractive index $n$ (-)
206.7	1.385
210.2	1.370
213.8	1.370
217.5	1.389
221.4	1.422
225.5	1.475
229.6	1.553
234.0	1.661
238.5	1.805
243.1	2.007
248.0	2.304
253.1	2.740
258.3	3.221
263.8	3.762
270.0	4.120
275.6	4.127
281.8	4.015
288.4	3.903
295.2	3.815
302.4	3.758
310	3.729
317.9	3.725
326.3	3.750
335.1	3.822
344.4	3.977
354.3	4.224
364.7	4.429
375.8	4.665
387.5	4.649

400	4.497
413.3	4.343
427.6	4.208
442.9	4.092
459.3	3.992
476.9	3.909
496	3.837
516.7	3.758
539.1	3.690
563.6	3.658
590.5	3.546
620.0	3.467
652.6	3.405
688.9	3.354
729.4	3.313
775.0	3.274
826.7	3.237
885.7	3.227
953.8	3.203
1033.3	3.182
1127.3	3.163
1240	3.147
1377.8	3.133
1550	3.122
1771.4	3.112
2066.7	3.103

Wavelength $\lambda$ (nm)	Extinction coefficient $k$ (-)
206.7	2.420
210.2	2.485
213.8	2.565
217.5	2.669
221.4	2.785
225.5	2.915
229.6	3.059
234.0	3.217
238.5	3.392
243.1	3.581
248.0	3.772
253.1	3.881
258.3	3.866
263.8	3.617
270.0	3.107
275.6	2.616
281.8	2.318
288.4	2.142
295.2	2.038
302.4	1.978
310	1.947
317.9	1.935
326.3	1.944
335.1	1.973
344.4	2.002
354.3	1.924
364.7	1.754
375.8	1.450
387.5	1.028
400	0.754
413.3	0.584
427.6	0.468

442.9	0.384
459.3	0.317
476.9	0.262
496	0.205
516.7	0.157
539.1	0.126
563.6	0.063
590.5	0.005
620.0	0
652.6	0
688.9	0
729.4	0
775.0	0
826.7	0
885.7	0
953.8	0
1033.3	0
1127.3	0
1240	0
1377.8	0
1550	0
1771.4	0
2066.7	0

#### **Al<sub>70</sub>Ga<sub>30</sub>As (AlGaAs)**

Wavelength $\lambda$ (nm)	Refractive index $n$ (-)
206.7	1.377
210.2	1.366
213.8	1.365
217.5	1.375
221.4	1.407
225.5	1.462
229.6	1.545
234.0	1.662
238.5	1.829
243.1	2.049
248.0	2.354
253.1	2.777
258.3	3.214
263.8	3.758
270.0	4.144
275.6	4.142
281.8	4.028
288.4	3.932
295.2	3.868
302.4	3.835
310	3.836
317.9	3.868
326.3	3.947
335.1	4.103
344.4	4.319
354.3	4.502
364.7	4.665
375.8	4.615
387.5	4.471
400	4.325
413.3	4.196
427.6	4.084
442.9	3.987

459.3	3.906
476.9	3.823
496	3.746
516.7	3.696
539.1	3.595
563.6	3.500
590.5	3.425
620.0	3.361
652.6	3.306
688.9	3.261
729.4	3.225
775.0	3.188
826.7	3.153
885.7	3.162
953.8	3.139
1033.3	3.120
1127.3	3.103
1240	3.088
1377.8	3.075
1550	3.064
1771.4	3.054
2066.7	3.046

Wavelength $\lambda$ (nm)	Extinction coefficient $k$ (-)
206.7	2.426
210.2	2.493
213.8	2.581
217.5	2.688
221.4	2.809
225.5	2.946
229.6	3.098
234.0	3.269
238.5	3.445
243.1	3.620
248.0	3.788
253.1	3.873
258.3	3.853
263.8	3.637
270.0	3.150
275.6	2.645
281.8	2.365
288.4	2.206
295.2	2.111
302.4	2.055
310	2.023
317.9	2.009
326.3	2.006
335.1	1.993
344.4	1.877
354.3	1.678
364.7	1.357
375.8	0.980
387.5	0.735
400	0.574
413.3	0.460
427.6	0.374
442.9	0.307
459.3	0.245
476.9	0.184
496	0.129

516.7	0.069
539.1	0.002
563.6	0
590.5	0
620.0	0
652.6	0
688.9	0
729.4	0
775.0	0
826.7	0
885.7	0
953.8	0
1033.3	0
1127.3	0
1240	0
1377.8	0
1550	0
1771.4	0
2066.7	0

#### **Al<sub>80</sub>Ga<sub>20</sub>As (AlGaAs)**

Wavelength $\lambda$ (nm)	Refractive index $n$ (-)
206.7	1.368
210.2	1.360
213.8	1.354
217.5	1.370
221.4	1.399
225.5	1.447
229.6	1.528
234.0	1.661
238.5	1.857
243.1	2.110
248.0	2.426
253.1	2.833
258.3	3.233
263.8	3.751
270.0	4.107
275.6	4.112
281.8	4.004
288.4	3.928
295.2	3.893
302.4	3.904
310	3.962
317.9	4.078
326.3	4.267
335.1	4.462
344.4	4.613
354.3	4.667
364.7	4.562
375.8	4.413
387.5	4.277
400	4.155
413.3	4.050
427.6	3.961
442.9	3.872
459.3	3.787
476.9	3.738
496	3.635
516.7	3.519
539.1	3.440

563.6	3.378
590.5	3.322
620.0	3.277
652.6	3.236
688.9	3.202
729.4	3.173
775.0	3.147
826.7	3.124
885.7	3.103
953.8	3.083
1033.3	3.065
1127.3	3.049
1240	3.035
1377.8	3.022
1550	3.012
1771.4	3.003
2066.7	2.995

Wavelength $\lambda$ (nm)	Extinction coefficient $k$ (-)
206.7	2.409
210.2	2.473
213.8	2.560
217.5	2.667
221.4	2.792
225.5	2.935
229.6	3.104
234.0	3.293
238.5	3.475
243.1	3.635
248.0	3.763
253.1	3.815
258.3	3.765
263.8	3.582
270.0	3.128
275.6	2.639
281.8	2.389
288.4	2.256
295.2	2.183
302.4	2.144
310	2.119
317.9	2.092
326.3	2.013
335.1	1.820
344.4	1.561
354.3	1.199
364.7	0.890
375.8	0.685
387.5	0.541
400	0.437
413.3	0.353
427.6	0.276
442.9	0.205
459.3	0.161
476.9	0.104
496	0.013
516.7	0.004
539.1	0.003
563.6	0
590.5	0
620.0	0

652.6	0
688.9	0
729.4	0
775.0	0
826.7	0
885.7	0
953.8	0
1033.3	0
1127.3	0
1240	0
1377.8	0
1550	0
1771.4	0
2066.7	0

### **Al<sub>90</sub>Ga<sub>10</sub>As (AlGaAs)**

Wavelength $\lambda$ (nm)	Refractive index $n$ (-)
459.3	3.807
476.9	3.637
496	3.524
516.7	3.438
539.1	3.369
563.6	3.312
590.5	3.263
620.0	3.221
652.6	3.183
688.9	3.151
729.4	3.122
775.0	3.096
826.7	3.073
885.7	3.052
953.8	3.033
1033.3	3.017
1127.3	3.002
1240	2.989
1377.8	2.977
1550	2.967
1771.4	2.959
2066.7	2.951

Wavelength $\lambda$ (nm)	Extinction coefficient $k$ (-)
459.3	0
476.9	0
496	0
516.7	0
539.1	0
563.6	0
590.5	0
620.0	0
652.6	0
688.9	0
729.4	0
775.0	0
826.7	0
885.7	0
953.8	0
1033.3	0
1127.3	0
1240	0

1377.8	0
1550	0
1771.4	0
2066.7	0

#### **AIAs (AIAs)**

Wavelength $\lambda$ (nm)	Refractive index $n$ (-)
450	3.644
500	3.383
550	3.252
600	3.171
650	3.116
700	3.075
750	3.045
800	3.021
850	3.002
900	2.987
950	2.974
1000	2.964
1050	2.955
1100	2.947

Wavelength $\lambda$ (nm)	Extinction coefficient $k$ (-)
450	0
500	0
550	0
600	0
650	0
700	0
750	0
800	0
850	0
900	0
950	0
1000	0
1050	0
1100	0

#### **AICu (AICu)**

Wavelength $\lambda$ (nm)	Refractive index $n$ (-)
250	.156
260	.169
270	.178
280	.184
290	.198
300	.212
310	.22
320	.234
330	.253
340	.26
350	.278
360	.284
370	.31
380	.319
390	.336
400	.371
410	.378
420	.39



430	.427
440	.443
450	.483
460	.496
470	.523
480	.546
490	.564
500	.604
510	.627
520	.659
530	.676
540	.697
550	.738
560	.778
570	.804
580	.846
590	.88
600	.912
610	.936
620	.992
630	1.054
640	1.087
650	1.145
660	1.176
670	1.209
680	1.292
690	1.355
700	1.408
710	1.459
720	1.529
730	1.609
740	1.677
750	1.755
760	1.844
770	1.892
780	1.974
790	2.048
800	2.114
810	2.152
820	2.157
830	2.137
840	2.08
850	2.002
860	1.88
870	1.774
880	1.678
890	1.588
900	1.357

Wavelength $\lambda$ (nm)	Extinction coefficient $k$ (-)
250	2.296
260	2.360
270	2.487
280	2.585
290	2.697
300	2.808
310	2.915
320	3.022
330	3.135
340	3.243

350	3.349
360	3.458
370	3.561
380	3.672
390	3.780
400	3.885
410	3.996
420	4.122
430	4.221
440	4.342
450	4.446
460	4.533
470	4.656
480	4.751
490	4.859
500	4.969
510	5.086
520	5.172
530	5.270
540	5.348
550	5.430
560	5.532
570	5.626
580	5.735
590	5.857
600	5.953
610	6.022
620	6.093
630	6.202
640	6.266
650	6.352
660	6.430
670	6.508
680	6.583
690	6.656
700	6.727
710	6.805
720	6.858
730	6.896
740	6.955
750	7.002
760	7.037
770	7.050
780	7.056
790	7.047
800	7.020
810	6.974
820	6.949
830	6.864
840	6.789
850	6.702
860	6.694
870	6.676
880	6.736
890	6.666
900	6.541

#### **AlGaAs (AlGaAs)**

Wavelength $\lambda$ (nm)	Refractive index $n$ (-)
200.82	1.25457489490509

209.02	1.28545248508453
217.22	1.32032263278961
225.42	1.37323021888733
233.62	1.48570561408997
241.82	1.7694000005722
250.02	2.46587252616882
258.22	3.389075756073
266.42	3.75496292114258
274.62	3.88819861412048
282.82	3.88765478134155
291.02	3.8235764503479
299.22	3.73733401298523
307.42	3.6508104801178
315.62	3.57570695877075
323.82	3.51893854141235
332.02	3.48516845703125
340.22	3.47775650024414
348.42	3.49891829490662
356.62	3.54958248138428
364.82	3.62924456596375
373.02	3.73598432540894
381.22	3.86674070358276
389.42	4.01790714263916
397.62	4.18640422821045
405.82	4.3716778755188
414.02	4.58073616027832
422.22	4.85699796676636
430.42	5.14157819747925
438.62	5.07710933685303
446.82	4.90418386459351
455.02	4.70998764038086
463.22	4.63189315795898
471.42	4.5785083770752
479.62	4.51574468612671
487.82	4.44697952270508
496.02	4.37857627868652
504.22	4.31417560577393
512.42	4.25516319274902
520.62	4.20172548294067
528.82	4.15352725982666
537.02	4.1100492477417
545.22	4.07074499130249
553.42	4.03510236740112
561.62	4.00266599655151
569.82	3.97304058074951
578.02	3.94588613510132
586.22	3.92091226577759
594.42	3.89786958694458
602.62	3.87654495239258
610.82	3.85675501823425
619.02	3.83834028244019
627.22	3.82116413116455
635.42	3.80510592460632
643.62	3.79006147384644
651.82	3.77593874931335
660.02	3.76265645027161
668.22	3.7501425743103
676.42	3.73833394050598
684.62	3.7271728515625
692.82	3.71660923957825

701.02	3.70659685134888
709.22	3.69709539413452
717.42	3.68806672096252
725.62	3.67947816848755
733.82	3.67129898071289
742.02	3.66350150108337
750.22	3.65606021881104
758.42	3.64895272254944
766.62	3.64215731620789
774.82	3.63565516471863
783.02	3.62942814826965
791.22	3.623459815979
799.42	3.61773538589478
807.62	3.61224031448364
815.82	3.60696196556091
824.02	3.60188865661621
832.22	3.59700894355774
840.42	3.5923125743866
848.62	3.5877902507782
856.82	3.58343267440796
865.02	3.57923102378845
873.22	3.57517838478088
881.42	3.57126688957214
889.62	3.56748986244202
897.82	3.56384110450745
906.02	3.56031394004822
914.22	3.55690360069275
922.42	3.55360388755798
930.62	3.5504105091095
938.82	3.54731845855713
947.02	3.54432320594788
955.22	3.54142069816589
963.42	3.53860712051392
971.62	3.53587818145752
979.82	3.53323078155518
988.02	3.53066158294678
996.22	3.52816724777222
1004.42	3.52574515342712
1012.62	3.52339196205139

Wavelength $\lambda$ (nm)	Extinction coefficient $k$ (-)
200.82	1.66781806945801
209.02	1.85217201709747
217.22	2.0677502155304
225.42	2.33885884284973
233.62	2.69836187362671
241.82	3.16800260543823
250.02	3.60006952285767
258.22	3.32953214645386
266.42	2.82239437103271
274.62	2.3909318447113
282.82	2.05908346176147
291.02	1.82610464096069
299.22	1.67490649223328
307.42	1.58738803863525
315.62	1.54888486862183
323.82	1.54801416397095
332.02	1.57547581195831
340.22	1.62297177314758
348.42	1.68255186080933

356.62	1.74640214443207
364.82	1.8069748878479
373.02	1.85733163356781
381.22	1.89154934883118
389.42	1.90506625175476
397.62	1.89482223987579
405.82	1.85895752906799
414.02	1.79536104202271
422.22	1.69268214702606
430.42	1.28904664516449
438.62	.868514239788055
446.82	.620086073875427
455.02	.502179682254791
463.22	.469512969255447
471.42	.398350775241852
479.62	.32428365945816
487.82	.261832118034363
496.02	.213070780038834
504.22	.175852552056313
512.42	.147426322102547
520.62	.125486433506012
528.82	.108311600983143
537.02	9.46637615561485E-02
545.22	8.36590230464935E-02
553.42	7.46630877256393E-02
561.62	6.72161430120468E-02
569.82	6.09802231192589E-02
578.02	5.57035394012928E-02
586.22	5.11960536241531E-02
594.42	4.73123639822006E-02
602.62	4.39398363232613E-02
610.82	4.09902334213257E-02
619.02	3.83936129510403E-02
627.22	3.60940173268318E-02
635.42	3.40462736785412E-02
643.62	3.22135426104069E-02
651.82	3.05655729025602E-02
660.02	2.90773082524538E-02
668.22	2.77278702706099E-02
676.42	2.64997463673353E-02
684.62	2.53781229257584E-02
692.82	.024350443854928
701.02	2.34059747308493E-02
709.22	2.25355010479689E-02
717.42	2.17310786247253E-02
725.62	2.09858249872923E-02
733.82	2.02937498688698E-02
742.02	1.96496229618788E-02
750.22	1.90488547086716E-02
758.42	1.84874013066292E-02
766.62	1.79616939276457E-02
774.82	1.74685791134834E-02
783.02	1.70052405446768E-02
791.22	1.65691804140806E-02
799.42	1.61581467837095E-02
807.62	1.57701410353184E-02
815.82	1.54033545404673E-02
824.02	1.50561612099409E-02
832.22	1.47270923480392E-02
840.42	1.44148217514157E-02

848.62	1.41181424260139E-02
856.82	1.38359572738409E-02
865.02	1.35672688484192E-02
873.22	1.33111644536257E-02
881.42	1.30668161436915E-02
889.62	1.28334555774927E-02
897.82	1.26103842630982E-02
906.02	1.23969642445445E-02
914.22	1.21925948187709E-02
922.42	1.19967386126518E-02
930.62	1.18088880553842E-02
938.82	1.16285802796483E-02
947.02	1.14553812891245E-02
955.22	1.12888952717185E-02
963.42	1.11287469044328E-02
971.62	1.09745962545276E-02
979.82	1.08261201530695E-02
988.02	1.06830215081573E-02
996.22	.010545021854341
1004.42	1.04118594899774E-02
1012.62	1.02832932025194E-02

#### AIN (AIN)

Wavelength $\lambda$ (nm)	Refractive index $n$ (-)
225.45	2.31
248.0	2.22
275.56	2.16
310.0	2.11
354.29	2.078
413.33	2.05
496.0	2.02
620.0	2.005
826.67	1.99
1240.0	1.977

Wavelength $\lambda$ (nm)	Extinction coefficient $k$ (-)
206.0	0.0656
225.45	0.0269
248.0	0
275.56	0
310.0	0
354.29	0
413.33	0
496.0	0
620.0	0
826.67	0
1240.0	0

#### AION (AION)

Wavelength $\lambda$ (nm)	Refractive index $n$ (-)
404.66	1.812
435.83	1.806
546.01	1.792
589.3	1.793
852.11	1.778
1000	1.776
1020.4	1.776
1041.7	1.775
1063.8	1.774

1087	1.774
1111.1	1.773
1136.4	1.772
1219.5	1.771

Wavelength $\lambda$ (nm)	Extinction coefficient $k$ (-)
404.66	0
435.83	0
546.01	0
589.3	0
852.11	0
1000	0
1020.4	0
1041.7	0
1063.8	0
1087	0
1111.1	0
1136.4	0
1219.5	0

### **AlSb (AlSb)**

Wavelength $\lambda$ (nm)	Refractive index $n$ (-)
354.23	3.95
364.65	3.97
375.7	4.14
387.44	4.51
413.27	4.52
427.52	4.66
442.79	5.27
459.19	5.08
476.85	4.81
495.92	4.61
516.58	4.44
539.04	4.31
563.55	4.2
590.38	4.01
619.9	3.9036
652.53	3.8143
688.78	3.7343
729.29	3.6626
774.87	3.5985
399.94	4.57
826.53	3.5412
885.57	3.4901
953.69	3.4447
1033.17	3.4044

Wavelength $\lambda$ (nm)	Extinction coefficient $k$ (-)
354.23	2.6900
364.65	2.6400
375.70	2.6900
387.44	2.4700
413.27	1.9700
427.52	2.0600
442.79	1.5800
459.19	0.9200
476.85	0.6300
495.92	0.4600

516.58	0.3300
539.04	0.2400
563.55	0.0100
590.38	0.0060
619.90	0.0040
652.53	0.0030
688.78	0.0020
729.29	0.0010
774.87	0.0003
399.94	2.1200
826.53	0.0002
885.57	0.0001
953.69	0.0000
1033.17	0.0000

# APEXE

Wavelength $\lambda$ (nm)	Refractive index $n$ (-)
220	1.945277384
240	1.870849594
260	1.812948502
280	1.767018981
300	1.729973914
320	1.699660907
340	1.674542093
360	1.653494981
380	1.635684734
400	1.620480027
420	1.607396292
440	1.596056593
460	1.586164165
480	1.577482787
500	1.569822539
520	1.563029326
540	1.556977061
560	1.551561773
580	1.546697109
600	1.54231087
620	1.538342312
640	1.534740037
660	1.531460317
680	1.528465758
700	1.525724234
720	1.52320802
740	1.520893083
760	1.518758516
780	1.516786054
800	1.514959689
820	1.513265341
840	1.511690585
860	1.510224425
880	1.508857101
900	1.507579925
920	1.506385142
940	1.505265815
960	1.504215721
980	1.503229266
1000	1.502301409
1020	1.501427599
1040	1.500603719
1060	1.499826036



Wavelength $\lambda$ (nm)	Extinction coefficient $k$ (-)
200	1.5736
225	1.5206
250	1.4883
275	1.4675
300	1.4534
325	1.4435
350	1.4363
375	1.4309
400	1.4267
425	1.4234
450	1.4209
475	1.4187
500	1.417
525	1.4156
550	1.4144
575	1.4133
600	1.4125
625	1.4117
650	1.4111
675	1.4105
700	1.41
725	1.4095
750	1.4091
775	1.4088
800	1.4084
825	1.4082
850	1.4079
875	1.4077
900	1.4074
925	1.4072
950	1.4071
975	1.4069
1000	1.4068
1025	1.4066
1050	1.4065
1075	1.4064
1100	1.4062
1125	1.4061
1150	1.406
1175	1.406
1200	1.4059

#### **AR2600DUV**

Wavelength $\lambda$ (nm)	Refractive index $n$ (-)
220	2.087951916
240	1.938048997
260	1.837967298
280	1.768880258
300	1.719802469
320	1.684060425
340	1.657456496
360	1.637268938
380	1.621685101
400	1.60946875
420	1.59975866
440	1.591943276
460	1.585580755

480	1.580346812
500	1.576
520	1.572358163
540	1.569282204
560	1.56666471
580	1.564421869
600	1.562487654
620	1.56080958
640	1.559345573
660	1.558061645
680	1.556930131
700	1.555928363
720	1.555037642
740	1.55424245
760	1.553529834
780	1.552888923
800	1.552310547
820	1.551786929
840	1.551311447
860	1.550878435
880	1.550483025
900	1.550121018
920	1.549788778
940	1.549483145
960	1.549201363
980	1.548941021
1000	1.5487
1020	1.548476438
1040	1.548268687
1060	1.54807529

#### **Au (Gold)**

Wavelength $\lambda$ (nm)	Refractive index $n$ (-)
189.9785	1.427
194.9984	1.424
200	1.427
206.6333	1.422
210.1356	1.43
213.7586	1.432
217.5088	1.438
221.3929	1.442
225.4182	1.452
229.5926	1.454
233.9245	1.462
238.4231	1.47
243.098	1.478
247.96	1.484
253.0204	1.49
258.2917	1.504
263.7872	1.546
269.5217	1.598
275.5111	1.648
281.7727	1.69
288.3256	1.742
295.1905	1.776
302.3902	1.812
309.95	1.83
317.8974	1.84

326.2632	1.824
335.0811	1.798
344.3889	1.766
354.2285	1.74
364.6471	1.716
375.697	1.696
387.4375	1.674
399.9355	1.658
413.2667	1.636
427.5172	1.616
442.7857	1.562
459.1852	1.426
476.8461	1.242
495.92	.916
516.5833	.608
539.0435	.402
563.5454	.306
652.5263	.166
688.7778	.16
729.2941	.164
774.875	.174
826.5333	.188
885.5714	.21
953.6923	.236
1033.167	.272
1127.091	.312
1239.8	.372
1265.102	.389
1291.458	.403
1318.936	.419
1347.609	.436
1377.556	.454
1408.864	.473
1441.628	.493
1475.952	.515
1511.951	.537
1549.75	.559
1589.487	.583
1631.316	.609
1675.405	.636
1721.944	.665
1771.143	.696
1823.235	.73
1878.485	.767
1937.188	.807
1999.677	.85
2066.333	.896
2108.545	.92633
2149.818	.95607
2191.091	.98614
2232.364	1.01652
2273.636	1.04721
2314.909	1.0782
2356.182	1.10948
2397.455	1.14104
2438.727	1.17289
2480	1.205

Wavelength $\lambda$ (nm)	Extinction coefficient $k$ (-)
189.97854	1.135

194.99842	1.17
200	1.215
206.63333	1.306
210.13559	1.334
213.75862	1.364
217.50877	1.388
221.39285	1.418
225.41818	1.442
229.59259	1.478
233.92452	1.51
238.42307	1.55
243.09803	1.59
247.96	1.636
253.0204	1.698
258.29166	1.748
263.78723	1.784
269.52173	1.822
275.51111	1.852
281.77272	1.882
288.32558	1.9
295.19047	1.918
302.39024	1.92
309.94999	1.916
317.89743	1.904
326.26315	1.878
335.08107	1.86
344.38888	1.846
354.22856	1.848
364.64705	1.862
375.69696	1.906
387.43749	1.936
399.93548	1.956
413.26666	1.958
427.51723	1.94
442.78571	1.904
459.18518	1.846
476.84614	1.796
495.91999	1.84
516.58332	2.12
539.04347	2.54
563.54544	2.88
652.5263	3.15
688.77776	3.8
729.2941	4.35
774.87499	4.86
826.53332	5.39
885.57141	5.88
953.69229	6.47
1033.16665	7.07
1127.09089	7.93
1239.79998	8.77
1265.10202	8.09
1291.45831	8.25
1318.93615	8.42
1347.60867	8.59
1377.55553	8.77
1408.86361	8.96
1441.62788	9.15
1475.95235	9.36
1511.95119	9.58

1549.74997	9.81
1589.48715	10.1
1631.31576	10.3
1675.40537	10.6
1721.94441	10.9
1771.14282	11.2
1823.23526	11.5
1878.48481	11.9
1937.18746	12.2
1999.67738	12.6
2066.33329	13
2108.54545	13.25677
2149.81818	13.50552
2191.09091	13.7541
2232.36364	14.00263
2273.63636	14.2513
2314.90909	14.50012
2356.18182	14.74927
2397.45455	14.99887
2438.72727	15.24911
2480	15.5

### **AZ1518**

Wavelength $\lambda$ (nm)	Refractive index $n$ (-)
200	2.4173
225	2.1476
250	1.9862
275	1.8838
300	1.8155
325	1.7681
350	1.7341
375	1.709
400	1.69
425	1.6753
450	1.6637
475	1.6544
500	1.6468
525	1.6406
550	1.6354
575	1.6311
600	1.6274
625	1.6242
650	1.6215
675	1.6191
700	1.617
725	1.6151
750	1.6135
775	1.6121
800	1.6108
825	1.6096
850	1.6086
875	1.6076
900	1.6068
925	1.606
950	1.6053
975	1.6046
1000	1.604
1025	1.6035
1050	1.603

1075	1.6025
1100	1.6021
1125	1.6017
1150	1.6013
1175	1.6009
1200	1.6006

### **AZ6112**

Wavelength $\lambda$ (nm)	Refractive index $n$ (-)
200	2.2088
225	2.0222
250	1.9072
275	1.8322
300	1.7808
325	1.7442
350	1.7172
375	1.6968
400	1.6811
425	1.6686
450	1.6586
475	1.6505
500	1.6437
525	1.6381
550	1.6333
575	1.6293
600	1.6258
625	1.6228
650	1.6201
675	1.6178
700	1.6158
725	1.6139
750	1.6123
775	1.6109
800	1.6096
825	1.6084
850	1.6073
875	1.6064
900	1.6055
925	1.6047
950	1.6039
975	1.6032
1000	1.6026
1025	1.602
1050	1.6015
1075	1.601
1100	1.6005
1125	1.6001
1150	1.5997
1175	1.5993
1200	1.599

### **AZ6210B**

Wavelength $\lambda$ (nm)	Refractive index $n$ (-)
200	2.1581
225	1.9996
250	1.8992
275	1.832

300	1.7848
325	1.7505
350	1.7248
375	1.705
400	1.6894
425	1.6769
450	1.6668
475	1.6584
500	1.6514
525	1.6455
550	1.6405
575	1.6361
600	1.6324
625	1.6291
650	1.6263
675	1.6237
700	1.6215
725	1.6195
750	1.6177
775	1.6161
800	1.6146
825	1.6133
850	1.6121
875	1.611
900	1.6101
925	1.6091
950	1.6083
975	1.6075
1000	1.6068
1025	1.6062
1050	1.6055
1075	1.605
1100	1.6045
1125	1.604
1150	1.6035
1175	1.6031
1200	1.6027

#### **AZ7209**

Wavelength $\lambda$ (nm)	Refractive index $n$ (-)
200	2.3277
225	2.0864
250	1.9422
275	1.8508
300	1.7899
325	1.7477
350	1.7175
375	1.6952
400	1.6783
425	1.6653
450	1.655
475	1.6468
500	1.6402
525	1.6347
550	1.6301
575	1.6263
600	1.623
625	1.6202
650	1.6178

675	1.6157
700	1.6138
725	1.6122
750	1.6108
775	1.6095
800	1.6084
825	1.6074
850	1.6065
875	1.6056
900	1.6049
925	1.6042
950	1.6036
975	1.603
1000	1.6025
1025	1.602
1050	1.6016
1075	1.6012
1100	1.6008
1125	1.6004
1150	1.6001
1175	1.5998
1200	1.5995

#### **AZ7510**

Wavelength $\lambda$ (nm)	Refractive index $n$ (-)
200	2.198
225	2.012
250	1.898
275	1.8239
300	1.7733
325	1.7375
350	1.7112
375	1.6914
400	1.6761
425	1.6641
450	1.6545
475	1.6466
500	1.6401
525	1.6348
550	1.6302
575	1.6263
600	1.623
625	1.6201
650	1.6176
675	1.6154
700	1.6135
725	1.6118
750	1.6102
775	1.6089
800	1.6076
825	1.6065
850	1.6055
875	1.6046
900	1.6038
925	1.603
950	1.6023
975	1.6017
1000	1.6011
1025	1.6005
1050	1.6



1075	1.5996
1100	1.5991
1125	1.5987
1150	1.5983
1175	1.598
1200	1.5977

### **AZ7700**

Wavelength $\lambda$ (nm)	Refractive index $n$ (-)
200	2.2718
225	2.0625
250	1.9348
275	1.8522
300	1.7961
325	1.7564
350	1.7275
375	1.7058
400	1.6891
425	1.676
450	1.6655
475	1.657
500	1.65
525	1.6442
550	1.6393
575	1.6351
600	1.6316
625	1.6285
650	1.6258
675	1.6235
700	1.6214
725	1.6196
750	1.6179
775	1.6165
800	1.6152
825	1.614
850	1.6129
875	1.612
900	1.6111
925	1.6103
950	1.6095
975	1.6088
1000	1.6082
1025	1.6076
1050	1.6071
1075	1.6066
1100	1.6062
1125	1.6057
1150	1.6053
1175	1.605
1200	1.6046

### **AZEL2015**

Wavelength $\lambda$ (nm)	Refractive index $n$ (-)
200	2.1325
225	1.9731
250	1.8741
275	1.8088

300	1.7637
325	1.7314
350	1.7074
375	1.6892
400	1.6749
425	1.6637
450	1.6546
475	1.6471
500	1.6409
525	1.6357
550	1.6313
575	1.6276
600	1.6243
625	1.6215
650	1.619
675	1.6169
700	1.615
725	1.6132
750	1.6117
775	1.6104
800	1.6091
825	1.608
850	1.607
875	1.6061
900	1.6052
925	1.6045
950	1.6038
975	1.6031
1000	1.6025
1025	1.602
1050	1.6015
1075	1.601
1100	1.6006
1125	1.6001
1150	1.5998
1175	1.5994
1200	1.5991

#### **AZNOVA2071**

Wavelength $\lambda$ (nm)	Refractive index $n$ (-)
200	2.1884
225	2.0026
250	1.8888
275	1.8149
300	1.7645
325	1.7288
350	1.7026
375	1.6829
400	1.6677
425	1.6558
450	1.6462
475	1.6384
500	1.632
525	1.6266
550	1.6221
575	1.6183
600	1.615
625	1.6121
650	1.6096
675	1.6074

700	1.6055
725	1.6038
750	1.6023
775	1.601
800	1.5997
825	1.5986
850	1.5976
875	1.5967
900	1.5959
925	1.5952
950	1.5945
975	1.5938
1000	1.5932
1025	1.5927
1050	1.5922
1075	1.5917
1100	1.5913
1125	1.5909
1150	1.5905
1175	1.5902
1200	1.5899

#### **AZOFPR-800**

Wavelength $\lambda$ (nm)	Refractive index $n$ (-)
200	2.0329
225	1.9275
250	1.8569
275	1.8072
300	1.771
325	1.7436
350	1.7224
375	1.7057
400	1.6923
425	1.6813
450	1.6722
475	1.6646
500	1.6582
525	1.6527
550	1.6479
575	1.6438
600	1.6403
625	1.6371
650	1.6343
675	1.6319
700	1.6297
725	1.6277
750	1.6259
775	1.6243
800	1.6229
825	1.6215
850	1.6203
875	1.6192
900	1.6182
925	1.6173
950	1.6165
975	1.6157
1000	1.6149
1025	1.6143
1050	1.6136
1075	1.6131

1100	1.6125
1125	1.612
1150	1.6115
1175	1.6111
1200	1.6107

# **AZP4110**

Wavelength $\lambda$ (nm)	Refractive index $n$ (-)
400	1.6648
410	1.6609
420	1.6574
430	1.6541
440	1.651
450	1.6481
460	1.6454
470	1.6429
480	1.6406
490	1.6384
500	1.6363
510	1.6344
520	1.6325
530	1.6308
540	1.6292
550	1.6276
560	1.6262
570	1.6248
580	1.6235
590	1.6223
600	1.6211
610	1.62
620	1.6189
630	1.6179
640	1.6169
650	1.616
660	1.6151
670	1.6143
680	1.6135
690	1.6127
700	1.612
710	1.6113
720	1.6106
730	1.61
740	1.6093
750	1.6087
760	1.6082
770	1.6076
780	1.6071
790	1.6066
800	1.6061
810	1.6056
820	1.6052
830	1.6047
840	1.6043
850	1.6039
860	1.6035
870	1.6032
880	1.6028
890	1.6024
900	1.6021
910	1.6018

920	1.6014
930	1.6011
940	1.6008
950	1.6005
960	1.6003
970	1.6
980	1.5997
990	1.5995
1000	1.5992
1010	1.599
1020	1.5988
1030	1.5985
1040	1.5983
1050	1.5981
1060	1.5979
1070	1.5977
1080	1.5975
1090	1.5973
1100	1.5971
1110	1.5969
1120	1.5968
1130	1.5966
1140	1.5964
1150	1.5963
1160	1.5961
1170	1.5959
1180	1.5958
1190	1.5957
1200	1.5955

Wavelength $\lambda$ (nm)	Extinction coefficient $k$ (-)
400	0
410	0
420	0
430	0
440	0
450	0
460	0
470	0
480	0
490	0
500	0
510	0
520	0
530	0
540	0
550	0
560	0
570	0
580	0
590	0
600	0
610	0
620	0
630	0
640	0
650	0
660	0
670	0
680	0

690	0
700	0
710	0
720	0
730	0
740	0
750	0
760	0
770	0
780	0
790	0
800	0
810	0
820	0
830	0
840	0
850	0
860	0
870	0
880	0
890	0
900	0
910	0
920	0
930	0
940	0
950	0
960	0
970	0
980	0
990	0
1000	0
1010	0
1020	0
1030	0
1040	0
1050	0
1060	0
1070	0
1080	0
1090	0
1100	0
1110	0
1120	0
1130	0
1140	0
1150	0
1160	0
1170	0
1180	0
1190	0
1200	0

# **BARLi**

Wavelength $\lambda$ (nm)	Refractive index $n$ (-)
200	5.6235
225	4.134
250	3.2808
275	2.7635

300	2.4349
325	2.2179
350	2.07
375	1.9662
400	1.8915
425	1.8368
450	1.7958
475	1.7646
500	1.7406
525	1.7218
550	1.7069
575	1.6949
600	1.6853
625	1.6774
650	1.6709
675	1.6655
700	1.661
725	1.6572
750	1.6539
775	1.6512
800	1.6488
825	1.6468
850	1.6451
875	1.6435
900	1.6422
925	1.641
950	1.64
975	1.6391
1000	1.6383
1025	1.6376
1050	1.6369
1075	1.6363
1100	1.6358
1125	1.6353
1150	1.6349
1175	1.6345
1200	1.6342

#### **BaTiO<sub>3</sub> (Barium titanate)**

Wavelength $\lambda$ (nm)	Refractive index $n$ (-)
413.3	2.64
422	2.645
450	2.578
475	2.534
495.9	2.51
500	2.5
525	2.478
550	2.459
575	2.442
600	2.43
619.9	2.42
625	2.416
650	2.405
675	2.396
690	2.39
725	2.379
750	2.372
775	2.366
800	2.361

825	2.356
850	2.352
875	2.348
900	2.344
950	2.338
1000	2.332
1050	2.328
1100	2.324
1150	2.32
1200	2.317
1240	2.32
1250	2.314

# **BK7**

Wavelength $\lambda$ (nm)	Refractive index $n$ (-)
210.1356	1.63056
213.7586	1.62349
217.5088	1.61689
221.3929	1.61074
225.4182	1.60499
229.5926	1.59961
233.9245	1.59457
238.4231	1.58983
243.098	1.58538
247.96	1.58119
253.0204	1.57723
258.2917	1.57348
263.7872	1.56993
269.5217	1.56657
275.5111	1.56337
281.7727	1.56033
288.3256	1.55743
295.1905	1.55466
302.3902	1.55201
309.95	1.54948
317.8974	1.54705
326.2632	1.54473
335.0811	1.5425
344.3889	1.54036
354.2285	1.5383
364.6471	1.53633
375.697	1.53443
387.4375	1.53261
399.9355	1.53085
413.2667	1.52917
427.5172	1.52755
442.7857	1.526
459.1852	1.5245
476.8461	1.52307
495.92	1.52169
516.5833	1.52036
539.0435	1.51909
563.5454	1.51786
590.3809	1.51668
619.9	1.51554
652.5263	1.51444
688.7778	1.51337
729.2941	1.51232
774.875	1.51129
826.5333	1.51027



885.5714	1.50924
953.6923	1.50817
1033.167	1.50705
1127.091	1.50583
1239.8	1.50444

Wavelength $\lambda$ (nm)	Extinction coefficient $k$ (-)
210.13559	0
213.75862	0
217.50877	0
221.39285	0
225.41818	0
229.59259	0
233.92452	0
238.42307	0
243.09803	0
247.96	0
253.0204	0
258.29166	0
263.78723	0
269.52173	0
275.51111	0
281.77272	0
288.32558	0
295.19047	0
302.39024	0
309.94999	0
317.89743	0
326.26315	0
335.08107	0
344.38888	0
354.22856	0
364.64705	0
375.69696	0
387.43749	0
399.93548	0
413.26666	0
427.51723	0
442.78571	0
459.18518	0
476.84614	0
495.91999	0
516.58332	0
539.04347	0
563.54544	0
590.38094	0
619.89999	0
652.5263	0
688.77776	0
729.2941	0
774.87499	0
826.53332	0
885.57141	0
953.69229	0
1033.16665	0
1127.09089	0
1239.79998	0

**BSG (Boron silica glass)**

Wavelength $\lambda$ (nm)	Refractive index $n$ (-)
370	1.535
400	1.53
430	1.525
520	1.52
630	1.515
840	1.51

**CaF2 (Calcium fluoride)**

Wavelength $\lambda$ (nm)	Refractive index $n$ (-)
206.6333	1.48989
210.1356	1.48738
213.7586	1.48494
217.5088	1.48258
221.3929	1.4803
225.4182	1.47809
229.5926	1.47595
233.9245	1.47388
238.4231	1.47187
243.098	1.46993
247.96	1.46804
253.0204	1.46622
258.2917	1.46445
263.7872	1.46274
269.5217	1.46109
275.5111	1.45948
281.7727	1.45793
288.3256	1.45643
295.1905	1.45498
302.3902	1.45357
309.95	1.45221
317.8974	1.45089
326.2632	1.44962
335.0811	1.44839
344.3889	1.4472
354.2285	1.44606
364.6471	1.44495
375.697	1.44388
387.4375	1.44285
399.9355	1.44186
413.2667	1.4409
427.5172	1.43998
442.7857	1.43909
459.1852	1.43824
476.8461	1.43742
495.92	1.43663
516.5833	1.43588
539.0435	1.43515
563.5454	1.43445
590.3809	1.43378
619.9	1.43314
652.5263	1.43252
688.7778	1.43193
729.2941	1.43136
774.875	1.4308
826.5333	1.43026
885.5714	1.42973
953.6923	1.4292

1033.167	1.42867
1127.091	1.42811
1239.8	1.42751

Wavelength $\lambda$ (nm)	Extinction coefficient $k$ (-)
206.63333	0
210.13559	0
213.75862	0
217.50877	0
221.39285	0
225.41818	0
229.59259	0
233.92452	0
238.42307	0
243.09803	0
247.96	0
253.0204	0
258.29166	0
263.78723	0
269.52173	0
275.51111	0
281.77272	0
288.32558	0
295.19047	0
302.39024	0
309.94999	0
317.89743	0
326.26315	0
335.08107	0
344.38888	0
354.22856	0
364.64705	0
375.69696	0
387.43749	0
399.93548	0
413.26666	0
427.51723	0
442.78571	0
459.18518	0
476.84614	0
495.91999	0
516.58332	0
539.04347	0
563.54544	0
590.38094	0
619.89999	0
652.5263	0
688.77776	0
729.2941	0
774.87499	0
826.53332	0
885.57141	0
953.69229	0
1033.16665	0
1127.09089	0
1239.79998	0

**Carbon-Alpha (Amorphous carbon)**

Wavelength $\lambda$ (nm)	Refractive index $n$ (-)
300	2.04101
320	2.08178
340	2.11693
360	2.14159
380	2.15249
400	2.14879
420	2.13231
440	2.10679
460	2.07667
480	2.04575
500	2.01651
520	1.99016
540	1.96692
560	1.94654
580	1.92858
600	1.91272
620	1.89882
640	1.88692
660	1.87714
680	1.86945
700	1.86358
720	1.85902
740	1.85512
760	1.85129
780	1.84709
800	1.84235
820	1.83709
840	1.83153

Wavelength $\lambda$ (nm)	Extinction coefficient $k$ (-)
300	.48002
320	.4295
340	.37535
360	.31604
380	.25315
400	.19073
420	.13359
440	.08549
460	.04801
480	.02071
500	.00194
520	-.01026
540	-.0176
560	-.02135
580	-.02245
600	-.02156
620	-.01911
640	-.01526
660	-.01
680	-.0033
700	.00475
720	.01373
740	.02284
760	.03116
780	.03786
800	.04256
820	.04548
840	.04735

**CDdye**

Wavelength $\lambda$ (nm)	Refractive index $n$ (-)
499.07	1.0736
503.87	1.0796
508.66	1.0871
513.45	1.0962
518.22	1.1066
522.98	1.1185
527.74	1.1318
532.49	1.1464
537.23	1.1623
541.96	1.1793
546.68	1.1974
551.4	1.2166
556.1	1.2367
560.8	1.2577
565.49	1.2796
570.17	1.3022
574.84	1.3256
579.51	1.3496
584.16	1.3742
588.81	1.3995
593.45	1.4253
598.08	1.4516
602.7	1.4785
607.31	1.5061
611.92	1.5345
616.52	1.5637
621.1	1.5939
625.68	1.6257
630.26	1.6594
634.82	1.6958
639.37	1.7364
643.92	1.7849
648.46	1.8486
652.99	1.8874
657.51	1.8889
662.02	1.8686
666.52	1.8448
671.02	1.8337
675.5	1.8504
679.98	1.9078
684.45	2.006
688.92	2.1143
693.37	2.1935
697.81	2.2486
702.25	2.2848
706.68	2.3104
711.1	2.3328
715.51	2.3565
719.91	2.3841
724.31	2.4165
728.69	2.4538
733.07	2.4961
737.44	2.5435
741.8	2.5962
746.15	2.6562
750.5	2.7291

754.83	2.8262
759.16	2.8941
763.48	2.9157
767.79	2.9022
772.09	2.8686
776.38	2.8257
780.67	2.7798
784.94	2.7346
789.21	2.6915
793.47	2.6511
797.72	2.6138
801.96	2.5793
806.2	2.5474
810.42	2.518
814.64	2.4908
818.85	2.4657
823.05	2.4423
827.24	2.4205
831.43	2.4002
835.6	2.3812
839.77	2.3634
843.93	2.3467
848.08	2.3309
852.22	2.3161
856.35	2.302
860.48	2.2887
864.59	2.2761

Wavelength $\lambda$ (nm)	Extinction coefficient $k$ (-)
499.07	0.6417
503.87	0.6700
508.66	0.6981
513.45	0.7260
518.22	0.7535
522.98	0.7806
527.74	0.8073
532.49	0.8333
537.23	0.8587
541.96	0.8834
546.68	0.9073
551.4	0.9305
556.1	0.9528
560.8	0.9743
565.49	0.9949
570.17	1.0146
574.84	1.0336
579.51	1.0517
584.16	1.0689
588.81	1.0855
593.45	1.1013
598.08	1.1164
602.7	1.1309
607.31	1.1448
611.92	1.1583
616.52	1.1713
621.1	1.1839
625.68	1.1960
630.26	1.2078
634.82	1.2188
639.37	1.2285

643.92	1.2353
648.46	1.2222
652.99	1.1762
657.51	1.1345
662.02	1.1180
666.52	1.1325
671.02	1.1759
675.5	1.2401
679.98	1.3080
684.45	1.3498
688.92	1.3391
693.37	1.2983
697.81	1.2506
702.25	1.2065
706.68	1.1717
711.1	1.1464
715.51	1.1282
719.91	1.1144
724.31	1.1024
728.69	1.0902
733.07	1.0763
737.44	1.0596
741.8	1.0393
746.15	1.0145
750.5	0.9831
754.83	0.9178
759.16	0.8020
763.48	0.6752
767.79	0.5606
772.09	0.4658
776.38	0.3902
780.67	0.3305
784.94	0.2836
789.21	0.2461
793.47	0.2160
797.72	0.1914
801.96	0.1712
806.2	0.1543
810.42	0.1401
814.64	0.1280
818.85	0.1176
823.05	0.1087
827.24	0.1008
831.43	0.0940
835.6	0.0879
839.77	0.0825
843.93	0.0777
848.08	0.0733
852.22	0.0694
856.35	0.0659
860.48	0.0627
864.59	0.0597

#### **CdS (Cadmium sulphide)**

Wavelength $\lambda$ (nm)	Refractive index $n$ (-)
350	2.58
400	2.55
500	2.72
600	2.4

700	2.35
800	2.32
900	2.3
1000	2.28
1100	2.28
1200	2.27
1300	2.27
1400	2.26
1500	2.25
1600	2.25

Wavelength $\lambda$ (nm)	Extinction coefficient $k$ (-)
350	0.7
400	0.7
500	0.7
600	0.54
700	0.47
800	0.43
900	0.4
1000	0.37
1100	0.33
1200	0.28
1300	0.15
1400	0.04
1500	0
1600	0

#### **CdTe (Cadmium telluride)**

Wavelength $\lambda$ (nm)	Refractive index $n$ (-)
247.96	2.48
250.46	2.4769
253.02	2.48
255.63	2.4856
258.29	2.49
261.01	2.4875
263.79	2.48
266.62	2.4656
269.52	2.45
272.48	2.4394
275.51	2.43
278.61	2.4206
281.77	2.41
285.01	2.395
288.33	2.38
291.72	2.37
295.19	2.36
298.75	2.34
302.39	2.33
306.12	2.3469
309.95	2.39
313.87	2.4694
317.9	2.57
322.03	2.6887
326.26	2.8
330.61	2.8738
335.08	2.92
339.67	2.935
344.39	2.93



349.24	2.9094
354.23	2.89
359.36	2.8731
364.65	2.91
370.09	3.0975
375.7	3.3
381.48	3.395
387.44	3.44
393.59	3.4475
399.94	3.43
406.49	3.4041
413.27	3.37
420.27	3.3401
427.52	3.3109
435.02	3.2825
442.79	3.2554
450.84	3.23
459.19	3.2096
467.85	3.1908
476.85	3.1732
486.2	3.1564
495.92	3.14
506.04	3.121
516.58	3.1023
527.57	3.0841
539.04	3.0666
551.02	3.05
563.55	3.0359
576.65	3.023
590.38	3.011
604.78	3.0001
619.9	2.99
635.79	2.9788
652.53	2.9688
670.16	2.9604
688.78	2.954
708.46	2.95
729.29	2.9642
751.39	2.9777
774.87	2.9872
799.87	2.9891
826.53	2.98
855.03	2.9565
885.57	2.9205
918.37	2.894
953.69	2.872
991.84	2.8527
1033.17	2.8353
1078.09	2.8195
1127.09	2.805
1180.76	2.7917
1239.8	2.7793

Wavelength $\lambda$ (nm)	Extinction coefficient $k$ (-)
247.96	2.2
250.46	2.1219
253.02	2.04
255.63	1.9606
258.29	1.89
261.01	1.84

263.79	1.8
266.62	1.7631
269.52	1.73
272.48	1.6975
275.51	1.67
278.61	1.6538
281.77	1.64
285.01	1.62
288.33	1.6
291.72	1.5813
295.19	1.57
298.75	1.5706
302.39	1.59
306.12	1.6394
309.95	1.71
313.87	1.8206
317.9	1.9
322.03	1.8569
326.26	1.77
330.61	1.6862
335.08	1.61
339.67	1.5663
344.39	1.54
349.24	1.5163
354.23	1.52
359.36	1.5938
364.65	1.67
370.09	1.7112
375.7	1.67
381.48	1.4237
387.44	1.16
393.59	1.0681
399.94	1.02
406.49	.9404
413.27	.861
420.27	.7989
427.52	.7467
435.02	.703
442.79	.6666
450.84	.636
459.19	.6084
467.85	.5845
476.85	.5632
486.2	.5437
495.92	.525
506.04	.5006
516.58	.4766
527.57	.4533
539.04	.4313
551.02	.411
563.55	.3949
576.65	.3809
590.38	.369
604.78	.359
619.9	.351
635.79	.3463
652.53	.3431
670.16	.341
688.78	.3394
708.46	.338

729.29	.335
751.39	.331
774.87	.327
799.87	.323
826.53	.319
855.03	0
885.57	0
918.37	0
953.69	0
991.84	0
1033.17	0
1078.09	0
1127.09	0
1180.76	0
1239.8	0

### Co (Cobalt)

Wavelength $\lambda$ (nm)	Refractive index $n$ (-)
250	1.22378
260.8333	1.22444
271.6667	1.2186
282.5	1.20818
293.3333	1.21127
304.1667	1.22202
315	1.23059
325.8333	1.25163
336.6667	1.27019
347.5	1.29099
358.3333	1.31009
369.1667	1.32374
380	1.35443
390.8333	1.41395
401.6667	1.46262
412.5	1.51688
423.3333	1.5762
434.1667	1.63528
445	1.69694
455.8333	1.76687
466.6667	1.82169
477.5	1.88369
488.3333	1.95074
499.1667	2.02024
510	2.08588
520.8333	2.14652
531.6667	2.20599
542.5	2.27806
553.3333	2.33163
564.1667	2.40157
575	2.46132
585.8333	2.53099
596.6667	2.59219
607.5	2.66478
618.3333	2.7365
629.1667	2.7956
640	2.85942
650.8333	2.91605
661.6667	2.96934
672.5	3.02992
683.3333	3.09791

694.1667	3.151
705	3.19828
715.8333	3.2544
726.6667	3.30756
737.5	3.35247
748.3333	3.39635
759.1667	3.44314
770	3.49113
780.8333	3.54242
791.6667	3.58499
802.5	3.62793
813.3333	3.66963
824.1667	3.72571
835	3.74871
845.8333	3.78695
856.6667	3.80287
867.5	3.85296
878.3333	3.8858
889.1667	3.89955
900	3.84993

Wavelength $\lambda$ (nm)	Extinction coefficient $k$ (-)
250	1.74458
260.83333	1.80525
271.66667	1.87655
282.5	1.95868
293.33333	2.04777
304.16667	2.14214
315	2.23188
325.83333	2.32421
336.66667	2.41984
347.5	2.5128
358.33333	2.59916
369.16667	2.69626
380	2.81353
390.83333	2.91802
401.66667	3.01671
412.5	3.10369
423.33333	3.19261
434.16667	3.27925
445	3.36265
455.83333	3.4387
466.66667	3.50897
477.5	3.57948
488.33333	3.64353
499.16667	3.71538
510	3.7772
520.83333	3.84409
531.66667	3.89227
542.5	3.94865
553.33333	3.99648
564.16667	4.05014
575	4.10136
585.83333	4.14518
596.66667	4.18769
607.5	4.23552
618.33333	4.26807
629.16667	4.29734
640	4.33555
650.83333	4.36993

661.66667	4.39899
672.5	4.4196
683.33333	4.45171
694.16667	4.4619
705	4.49482
715.83333	4.52069
726.66667	4.5614
737.5	4.56462
748.33333	4.58974
759.16667	4.60937
770	4.64335
780.83333	4.66472
791.66667	4.69161
802.5	4.71813
813.33333	4.73961
824.16667	4.7706
835	4.77868
845.83333	4.81696
856.66667	4.83248
867.5	4.86283
878.33333	4.87317
889.16667	4.89205
900	4.76589

#### **Cr (Chromium)**

Wavelength $\lambda$ (nm)	Refractive index $n$ (-)
206.6333	1.46
210.1356	1.46
213.7586	1.47
217.5088	1.47
221.3929	1.45
225.4182	1.43
229.5926	1.41
233.9245	1.39
238.4231	1.37
243.098	1.36
247.96	1.36
253.0204	1.37
258.2917	1.38
263.7872	1.38
269.5217	1.39
275.5111	1.43
281.7727	1.44
288.3256	1.46
295.1905	1.5
302.3902	1.54
309.95	1.58
317.8974	1.63
326.2632	1.67
335.0811	1.71
344.3889	1.77
354.2285	1.84
364.6471	1.86
375.697	1.9
387.4375	1.95
399.9355	2.01
413.2667	2.08
427.5172	2.17
442.7857	2.27

459.1852	2.4
476.8461	2.56
495.92	2.75
516.5833	2.91
539.0435	3.11
563.5454	3.22
590.3809	3.21
619.9	3.16
652.5263	3.1
688.7778	3.06
729.2941	3.06
774.875	3.11
826.5333	3.21
885.5714	3.29
953.6923	3.37
1033.167	3.5
1127.091	3.62
1239.8	3.68

Wavelength $\lambda$ (nm)	Extinction coefficient $k$ (-)
206.63333	1.71
210.13559	1.72
213.75862	1.72
217.50877	1.72
221.39285	1.73
225.41818	1.74
229.59259	1.76
233.92452	1.78
238.42307	1.81
243.09803	1.85
247.96	1.9
253.0204	1.95
258.29166	2
263.78723	2.05
269.52173	2.09
275.51111	2.14
281.77272	2.19
288.32558	2.24
295.19047	2.3
302.39024	2.35
309.94999	2.4
317.89743	2.45
326.26315	2.5
335.08107	2.55
344.38888	2.59
354.22856	2.64
364.64705	2.68
375.69696	2.72
387.43749	2.77
399.93548	2.85
413.26666	2.93
427.51723	3.02
442.78571	3.1
459.18518	3.18
476.84614	3.26
495.91999	3.3
516.58332	3.33
539.04347	3.33
563.54544	3.32
590.38094	3.3

619.89999	3.3
652.5263	3.33
688.77776	3.37
729.2941	3.4
774.87499	3.44
826.53332	3.48
885.57141	3.52
953.69229	3.56
1033.16665	3.58
1127.09089	3.58
1239.79998	3.62

### **Cu (Copper)**

Wavelength $\lambda$ (nm)	Refractive index $n$ (-)
206.6333	1.03647
213.7586	1.10319
221.3929	1.18408
229.5926	1.27608
238.4231	1.3776
247.96	1.46912
258.2917	1.53346
269.5217	1.52015
281.7727	1.48705
295.1905	1.41939
309.95	1.34368
326.2632	1.33456
344.3889	1.30895
364.6471	1.27004
387.4375	1.23088
413.2667	1.18458
442.7857	1.16797
476.8461	1.15235
516.5833	1.11997
539.0435	1.0379
563.5454	.82616
590.3809	.46818
619.9	.27191
652.5263	.21408
670.1622	.21541
688.7778	.21272
708.4572	.21422
729.2941	.22333
826.5333	.25951
1239.8	.43549
2479.6	1.71267

Wavelength $\lambda$ (nm)	Extinction coefficient $k$ (-)
206.63333	1.59194
213.75862	1.67243
221.39285	1.73552
229.59259	1.7828
238.42307	1.7966
247.96	1.77998
258.29166	1.71508
269.52173	1.66759
281.77272	1.63747
295.19047	1.64155
309.94999	1.71915

326.26315	1.80584
344.38888	1.87173
364.64705	1.95269
387.43749	2.06762
413.26666	2.20754
442.78571	2.36308
476.84614	2.50358
516.58332	2.60275
539.04347	2.59176
563.54544	2.60241
590.38094	2.80877
619.89999	3.23635
652.5263	3.66686
670.16215	3.8531
688.77776	4.04293
708.45713	4.24805
729.2941	4.43282
826.53332	5.25998
1239.79998	8.48467
2479.59995	17.6333

### Diamond

Wavelength $\lambda$ (nm)	Refractive index $n$ (-)
213.76	2.78
217.31	2.77
220.98	2.743
224.77	2.712
228.7	2.692
232.77	2.684
236.98	2.671
241.35	2.657
245.89	2.644
250.6	2.633
255.49	2.623
260.57	2.612
265.87	2.599
271.38	2.586
277.13	2.575
283.12	2.566
289.38	2.558
295.93	2.549
302.77	2.539
309.94	2.529
317.46	2.521
325.35	2.513
333.65	2.505
342.38	2.498
351.57	2.491
361.28	2.484
371.54	2.477
382.39	2.471
393.9	2.465
406.12	2.459
419.13	2.454
433	2.449
447.81	2.444
463.68	2.439
480.71	2.434
499.04	2.43
518.82	2.426



540.24	2.422
563.5	2.418
588.85	2.414
616.6	2.411
647.08	2.408
680.74	2.405
718.09	2.402
759.78	2.399
806.61	2.397
859.59	2.395
920.01	2.392
989.58	2.39
1070.52	2.389
1165.89	2.387
1279.91	2.385
1418.65	2.384
1591.13	2.382
1811.34	2.382
2102.31	2.381
2504.65	2.38

Wavelength $\lambda$ (nm)	Extinction coefficient $k$ (-)
213.76	0.005
217.31	0.003
220.98	0.001
224.77	0
228.70	0
232.77	0
236.98	0
241.35	0
245.89	0
250.60	0
255.49	0
260.57	0
265.87	0
271.38	0
277.13	0
283.12	0
289.38	0
295.93	0
302.77	0
309.94	0
317.46	0
325.35	0
333.65	0
342.38	0
351.57	0
361.28	0
371.54	0
382.39	0
393.90	0
406.12	0
419.13	0
433.00	0
447.81	0
463.68	0
480.71	0
499.04	0
518.82	0
540.24	0

563.50	0
588.85	0
616.60	0
647.08	0
680.74	0
718.09	0
759.78	0
806.61	0
859.59	0
920.01	0
989.58	0
1070.52	0
1165.89	0
1279.91	0
1418.65	0
1591.13	0
1811.34	0
2102.31	0
2504.65	0

**Dlcarbon (Diamond containing some non-diamond crystallized carbon)**

Wavelength  $\lambda$  (nm)      Refractive index  $n$  (-)

206.6333	2.541
215.6174	2.464
225.4182	2.393
236.1524	2.331
247.96	2.278
261.0105	2.234
275.5111	2.198
291.7177	2.167
309.95	2.141
354.2285	2.099
413.2667	2.066
495.92	2.041
619.9	2.022
826.5333	2.008
1239.8	1.998

Wavelength  $\lambda$  (nm)      Extinction coefficient  $k$  (-)

206.63333	0.01
1239.79998	0.01

**GaAs (GaAs)**

Wavelength  $\lambda$  (nm)      Refractive index  $n$  (-)

206.63	1.264
210.14	1.288
213.76	1.311
217.51	1.325
221.39	1.349
225.42	1.383
229.59	1.43
233.92	1.499
238.42	1.599
243.1	1.802
247.96	2.273
253.02	2.89
258.29	3.342
263.79	3.598
269.52	3.769

275.51	3.913
281.77	4.015
288.33	3.939
295.19	3.81
302.39	3.692
309.95	3.601
317.9	3.538
326.26	3.501
335.08	3.485
344.39	3.495
354.23	3.531
364.65	3.596
375.7	3.709
387.44	3.938
399.94	4.373
413.27	4.509
427.52	5.052
442.79	4.959
459.19	4.694
476.85	4.492
495.92	4.333
516.58	4.205
539.04	4.1
563.55	4.013
590.38	3.94
619.9	3.878
652.53	3.826
688.78	3.785
729.29	3.742
774.87	3.7
826.53	3.666
885.57	3.614
953.69	3.5388
1033.17	3.492
1127.09	3.4546
1239.8	3.4232
1377.56	3.3965
1549.75	3.3737
1771.14	3.3543
2066.33	3.3378

Wavelength $\lambda$ (nm)	Extinction coefficient $k$ (-)
206.63	2.4720
210.14	2.5570
213.76	2.6250
217.51	2.7100
221.39	2.8150
225.42	2.9360
229.59	3.0790
233.92	3.2550
238.42	3.4840
243.10	3.7950
247.96	4.0840
253.02	4.0470
258.29	3.7700
263.79	3.4520
269.52	3.1690
275.51	2.9190
281.77	2.5630
288.33	2.2600

295.19	2.0690
302.39	1.9690
309.95	1.9200
317.90	1.9040
326.26	1.9090
335.08	1.9310
344.39	1.9650
354.23	2.0130
364.65	2.0760
375.70	2.1620
387.44	2.2880
399.94	2.1460
413.27	1.9480
427.52	1.7210
442.79	0.9910
459.19	0.6960
476.85	0.5390
495.92	0.4410
516.58	0.3710
539.04	0.3200
563.55	0.2760
590.38	0.2400
619.90	0.2110
652.53	0.1790
688.78	0.1510
729.29	0.1120
774.87	0.0910
826.53	0.0800
885.57	0.0017
953.69	0.0000
1033.17	0.0000
1127.09	0.0000
1239.80	0.0000
1377.56	0.0000
1549.75	0.0000
1771.14	0.0000
2066.33	0.0000

#### **Ga<sub>0.5</sub>In<sub>0.5</sub>P (GaInP)**

Wavelength $\lambda$ (nm)	Refractive index $n$ (-)
650	3.69
675	3.57
700	3.47
725	3.43
750	3.39
775	3.37
800	3.35
825	3.33
850	3.32

#### **GaInP (exact composition unknown)**

Wavelength $\lambda$ (nm)	Refractive index $n$ (-)
206.7	1.22
210.2	1.22
213.8	1.24
217.5	1.24
221.4	1.25
225.5	1.26
229.6	1.30

234.0	1.33
238.5	1.41
243.1	1.50
248.0	1.64
253.1	1.83
258.3	2.08
263.8	2.47
270.0	2.82
275.6	3.16
281.8	3.37
288.4	3.44
295.2	3.45
302.4	3.41
310	3.32
317.9	3.28
326.3	3.23
335.1	3.21
344.4	3.20
354.3	3.20
364.7	3.23
375.8	3.24
387.5	3.30
400	3.38
413.3	3.51
427.6	3.72
442.9	3.89
459.3	4.08
476.9	4.30
496	4.48
516.7	4.44
539.1	4.33
563.6	4.21
590.5	4.10
620.0	4.02
652.6	3.94
688.9	3.87
729.4	3.81
775.0	3.75
826.7	3.71
1000	3.66
1020.6	3.65
1200.4	3.635
1301.2	3.62
1401.1	3.615
1501.2	3.6
1600	3.59
1701	3.58
1800	3.51
1901.8	3.27

Wavelength $\lambda$ (nm)	Extinction coefficient $k$ (-)
206.7	2.13
210.2	2.16
213.8	2.20
217.5	2.26
221.4	2.33
225.5	2.43
229.6	2.52
234.0	2.60
238.5	2.73

243.1	2.87
248.0	3.02
253.1	3.18
258.3	3.31
263.8	3.39
270.0	3.29
275.6	3.05
281.8	2.83
288.4	2.54
295.2	2.34
302.4	2.16
310	2.02
317.9	1.95
326.3	1.91
335.1	1.87
344.4	1.87
354.3	1.87
364.7	1.88
375.8	1.91
387.5	1.95
400	2.00
413.3	2.06
427.6	2.09
442.9	2.01
459.3	1.85
476.9	1.67
496	1.22
516.7	0.89
539.1	0.71
563.6	0.61
590.5	0.55
620.0	0.48
652.6	0.44
688.9	0.41
729.4	0.40
775.0	0.38
826.7	0.36
1000	0.28
1020.6	0.26
1200.4	0.22
1301.2	0.19
1401.1	0.17
1501.2	0.08
1600	0.07
1701	0.05
1800	0
1901.8	0

### GaN

Wavelength $\lambda$ (nm)	Refractive index $n$ (-)
354.29	2.66
413.33	2.49
496.0	2.38
620.0	2.32
826.67	2.29
1240.0	2.262

Wavelength $\lambda$ (nm)	Extinction coefficient $k$ (-)
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248.0	0.418
275.56	0.373
310.0	0.323
354.29	0.268
413.33	0.007
496.0	0
620.0	0
826.67	0
1240.0	0

# **GaP**

Wavelength $\lambda$ (nm)	Refractive index $n$ (-)
206.63	.91
207.48	1.17
208.33	1.3
209.19	1.34
210.06	1.33
210.93	1.33
211.82	1.34
212.71	1.34
213.6	1.35
214.51	1.36
215.42	1.36
216.34	1.37
217.27	1.39
218.2	1.4
219.14	1.41
220.1	1.42
221.06	1.44
222.03	1.45
223	1.47
223.99	1.5
224.98	1.52
225.99	1.56
227	1.61
228.02	1.67
229.05	1.74
230.09	1.82
231.14	1.92
232.2	2.03
233.27	2.16
234.35	2.31
235.44	2.45
236.54	2.6
237.65	2.74
238.76	2.87
239.9	3
241.04	3.12
242.19	3.25
243.35	3.36
244.53	3.46
245.71	3.54
246.91	3.61
248.12	3.67
249.34	3.72
250.57	3.76
251.82	3.81
253.08	3.84
254.35	3.89
255.63	3.94

256.92	4.01
258.23	4.06
259.56	4.11
260.89	4.14
262.24	4.17
263.61	4.18
264.99	4.18
266.38	4.17
267.79	4.15
269.21	4.12
270.65	4.08
272.1	4.05
273.57	4.02
275.06	3.99
276.56	3.96
278.07	3.93
279.61	3.9
281.16	3.88
282.73	3.86
284.32	3.84
285.92	3.82
287.54	3.8
289.18	3.78
290.84	3.78
292.52	3.77
294.22	3.76
295.94	3.75
297.68	3.75
299.44	3.75
301.22	3.75
303.02	3.75
304.84	3.76
306.69	3.77
308.55	3.78
310.44	3.79
312.36	3.81
314.3	3.84
316.26	3.86
318.24	3.9
320.26	3.94
322.29	4
324.36	4.08
326.45	4.21
328.56	4.38
330.71	4.61
332.88	4.88
335.08	5.15
337.31	5.36
339.57	5.46
341.86	5.46
344.18	5.42
346.54	5.33
348.92	5.24
351.34	5.15
353.8	5.06
356.29	4.98
358.81	4.91
361.37	4.84
363.96	4.77
366.6	4.7



369.27	4.64
371.98	4.59
374.73	4.54
377.52	4.49
380.36	4.44
383.23	4.4
386.15	4.36
389.12	4.32
392.13	4.28
395.19	4.25
398.29	4.21
401.45	4.18
404.66	4.15
407.91	4.12
411.22	4.09
414.59	4.07
418.01	4.05
421.49	4.02
425.02	4.01
428.62	3.99
432.27	3.97
435.99	3.95
439.78	3.94
443.63	3.91
447.54	3.9
451.53	3.87
455.59	3.85
459.73	3.81
463.94	3.77
468.22	3.73
472.59	3.73
477.04	3.69
481.57	3.66
486.19	3.64
490.9	3.63
495.71	3.61
500.6	3.5
505.6	3.54
510.69	3.55
515.89	3.53
521.2	3.52
526.62	3.56
532.15	3.46
537.8	3.47
543.57	3.46
549.46	3.45
555.48	3.44
561.64	3.42
567.94	3.41
574.37	3.41
580.96	3.37
587.7	3.36
594.59	3.36
601.65	3.35
608.88	3.34
616.29	3.33
623.88	3.32
631.65	3.32
639.63	3.3
647.81	3.29

656.19	3.29
664.8	3.27
673.64	3.27
682.72	3.27
692.04	3.24
701.63	3.25
711.48	3.25
721.61	3.24
732.03	3.23
742.77	3.22
753.82	3.22
765.2	3.22
776.93	3.21
789.03	3.18
801.51	3.18
814.39	3.19
827.7	3.18
841.44	3.17
855.65	3.16
870.35	3.16
885.56	3.15
901.31	3.14
917.63	3.13
934.56	3.13
952.12	3.13
970.35	3.12
989.3	3.12
1009	3.1
1029.5	3.06
1050.85	3.04
1073.1	3.05
1096.32	3.09
1120.57	3.18
1145.91	3.32
1172.42	3.52
1200.19	3.8

Wavelength $\lambda$ (nm)	Extinction coefficient $k$ (-)
206.63	2.28
207.48	2.58
208.33	2.73
209.19	2.79
210.06	2.8
210.93	2.83
211.82	2.86
212.71	2.89
213.60	2.92
214.51	2.96
215.42	3
216.34	3.05
217.27	3.09
218.20	3.13
219.14	3.18
220.10	3.23
221.06	3.28
222.03	3.34
223.00	3.39
223.99	3.45
224.98	3.53
225.99	3.6

227.00	3.68
228.02	3.76
229.05	3.84
230.09	3.93
231.14	4.01
232.20	4.08
233.27	4.14
234.35	4.18
235.44	4.2
236.54	4.2
237.65	4.19
238.76	4.16
239.90	4.13
241.04	4.1
242.19	4.04
243.35	3.96
244.53	3.88
245.71	3.79
246.91	3.7
248.12	3.62
249.34	3.55
250.57	3.47
251.82	3.41
253.08	3.36
254.35	3.31
255.63	3.25
256.92	3.18
258.23	3.1
259.56	3.01
260.89	2.92
262.24	2.82
263.61	2.72
264.99	2.63
266.38	2.54
267.79	2.46
269.21	2.39
270.65	2.32
272.10	2.27
273.57	2.23
275.06	2.19
276.56	2.16
278.07	2.14
279.61	2.11
281.16	2.1
282.73	2.08
284.32	2.08
285.92	2.07
287.54	2.06
289.18	2.06
290.84	2.06
292.52	2.06
294.22	2.06
295.94	2.06
297.68	2.07
299.44	2.08
301.22	2.09
303.02	2.11
304.84	2.12
306.69	2.14
308.55	2.16

310.44	2.18
312.36	2.2
314.30	2.23
316.26	2.27
318.24	2.31
320.26	2.36
322.29	2.42
324.36	2.49
326.45	2.57
328.56	2.63
330.71	2.66
332.88	2.61
335.08	2.45
337.31	2.2
339.57	1.9
341.86	1.62
344.18	1.39
346.54	1.2
348.92	1.05
351.34	0.93
353.80	0.83
356.29	0.75
358.81	0.67
361.37	0.63
363.96	0.58
366.60	0.53
369.27	0.5
371.98	0.47
374.73	0.44
377.52	0.41
380.36	0.39
383.23	0.36
386.15	0.35
389.12	0.33
392.13	0.31
395.19	0.3
398.29	0.28
401.45	0.27
404.66	0.25
407.91	0.24
411.22	0.23
414.59	0.22
418.01	0.21
421.49	0.2
425.02	0.19
428.62	0.18
432.27	0.18
435.99	0.15
439.78	0.14
443.63	0.11
447.54	0.1
451.53	0.02
455.59	0.04
459.73	0.07
463.94	0.01
468.22	0.01
472.59	0.01
477.04	0.01
481.57	0
486.19	0

490.90	0
495.71	0
500.60	0
505.60	0
510.69	0
515.89	0
521.20	0
526.62	0
532.15	0
537.80	0
543.57	0
549.46	0
555.48	0
561.64	0
567.94	0
574.37	0
580.96	0
587.70	0
594.59	0
601.65	0
608.88	0
616.29	0
623.88	0
631.65	0
639.63	0
647.81	0
656.19	0
664.80	0
673.64	0
682.72	0
692.04	0
701.63	0
711.48	0
721.61	0
732.03	0
742.77	0
753.82	0
765.20	0
776.93	0
789.03	0
801.51	0
814.39	0
827.70	0
841.44	0
855.65	0
870.35	0
885.56	0
901.31	0
917.63	0
934.56	0
952.12	0
970.35	0
989.30	0
1009.00	0
1029.50	0
1050.85	0
1073.10	0
1096.32	0
1120.57	0
1145.91	0

1172.42	0
1200.19	0

# **GaSb**

Wavelength $\lambda$ (nm)	Refractive index $n$ (-)
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206.63	.93543
210.14	.98494
213.76	1.02243
217.51	1.06221
221.39	1.12741
225.42	1.21177
229.59	1.29847
233.92	1.34534
238.42	1.35606
243.1	1.35764
247.96	1.36859
253.02	1.3868
258.29	1.40761
263.79	1.44395
269.52	1.50292
275.51	1.5865
281.77	1.72264
288.33	1.98907
295.19	2.5218
302.39	3.09948
309.95	3.44975
317.9	3.61959
326.26	3.70134
335.08	3.74767
344.39	3.77447
354.23	3.78534
364.65	3.79411
375.7	3.80759
387.44	3.80026
399.94	3.76573
413.27	3.7317
427.52	3.72772
442.79	3.75964
459.19	3.83634
476.85	3.98447
495.92	4.3115
516.58	4.51326
539.04	4.49211
563.55	4.52077
590.38	4.70459
619.9	5.23879
652.53	5.052
688.78	4.81661
729.29	4.64297
774.87	4.50669
826.53	4.3879

Wavelength $\lambda$ (nm)	Extinction coefficient $k$ (-)
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206.63	2.416
210.14	2.44379
213.76	2.47939
217.51	2.53481
221.39	2.60155

225.42	2.64488
229.59	2.65312
233.92	2.63836
238.42	2.64479
243.10	2.68481
247.96	2.75064
253.02	2.82882
258.29	2.92837
263.79	3.05516
269.52	3.20776
275.51	3.39205
281.77	3.62815
288.33	3.92319
295.19	4.13019
302.39	3.97615
309.95	3.64345
317.90	3.32317
326.26	3.06902
335.08	2.86218
344.39	2.68991
354.23	2.54495
364.65	2.43008
375.70	2.31879
387.44	2.20998
399.94	2.13372
413.27	2.10869
427.52	2.1206
442.79	2.15659
459.19	2.21122
476.85	2.28035
495.92	2.28517
516.58	1.96177
539.04	1.78858
563.55	1.74682
590.38	1.80281
619.90	1.37837
652.53	0.82868
688.78	0.61132
729.29	0.48493
774.87	0.41627
826.53	0.34447

Ge (Germanium)

Wavelength $\lambda$ (nm)	Refractive index $n$ (-)
206.63	1.023
210.14	1.108
213.76	1.209
217.51	1.31
221.39	1.36
225.42	1.38
229.59	1.383
233.92	1.371
238.42	1.364
243.1	1.37
247.96	1.394
253.02	1.435
258.29	1.498
263.79	1.586
269.52	1.72
275.51	1.953

281.77	2.516
288.33	3.338
295.19	3.745
302.39	3.869
309.95	3.905
317.9	3.92
326.26	3.936
335.08	3.958
344.39	3.985
354.23	4.02
364.65	4.07
375.7	4.128
387.44	4.157
399.94	4.141
413.27	4.082
427.52	4.037
442.79	4.035
459.19	4.082
476.85	4.18
495.92	4.34
516.58	4.61
539.04	5.062
563.55	5.283
590.38	5.748
619.9	5.588
652.53	5.294
688.78	5.067
729.29	4.897
774.87	4.763
826.53	4.653
885.57	4.56
953.69	4.495
1033.17	4.42
1127.09	4.385
1239.8	4.325
1377.56	4.285
1549.75	4.275
1771.14	4.18
2066.33	4.104

Wavelength $\lambda$ (nm)	Extinction coefficient $k$ (-)
206.63	2.774
210.14	2.831
213.76	2.873
217.51	2.866
221.39	2.846
225.42	2.842
229.59	2.854
233.92	2.897
238.42	2.973
243.10	3.073
247.96	3.197
253.02	3.342
258.29	3.509
263.79	3.709
269.52	3.96
275.51	4.297
281.77	4.669
288.33	4.507
295.19	4.009



302.39	3.614
309.95	3.336
317.90	3.137
326.26	2.986
335.08	2.863
344.39	2.759
354.23	2.667
364.65	2.579
375.70	2.469
387.44	2.34
399.94	2.215
413.27	2.145
427.52	2.14
442.79	2.181
459.19	2.24
476.85	2.309
495.92	2.384
516.58	2.455
539.04	2.318
563.55	2.049
590.38	1.634
619.90	0.933
652.53	0.638
688.78	0.5
729.29	0.401
774.87	0.345
826.53	0.298
885.57	0.19
953.69	0.167
1033.17	0.123
1127.09	0.103
1239.80	0.0809
1377.56	0.0745
1549.75	0.00567
1771.14	0.00028
2066.33	0

#### **HfO<sub>2</sub> (Hafnium dioxide)**

Wavelength $\lambda$ (nm)	Refractive index $n$ (-)
250	2.1222
275	2.0887
300	2.06
325	2.0357
350	2.0151
375	1.9978
400	1.983
425	1.9705
450	1.9597
475	1.9504
500	1.9423
525	1.9353
550	1.9291
575	1.9237
600	1.9189
625	1.9146
650	1.9108
675	1.9073
700	1.9043
725	1.9015
750	1.899

775	1.8967
800	1.8946
825	1.8927
850	1.8909
875	1.8894
900	1.8879

Wavelength $\lambda$ (nm)	Extinction coefficient $k$ (-)
250.00	0
275.00	0
300.00	0
325.00	0
350.00	0
375.00	0
400.00	0
425.00	0
450.00	0
475.00	0
500.00	0
525.00	0
550.00	0
575.00	0
600.00	0
625.00	0
650.00	0
675.00	0
700.00	0
725.00	0
750.00	0
775.00	0
800.00	0
825.00	0
850.00	0
875.00	0
900.00	0

### InAs

Wavelength $\lambda$ (nm)	Refractive index $n$ (-)
206.63	1.43377
210.14	1.38298
213.76	1.33262
217.51	1.29333
221.39	1.27631
225.42	1.28165
229.59	1.31167
233.92	1.36572
238.42	1.43588
243.1	1.48359
247.96	1.52395
253.02	1.60819
258.29	1.80331
263.79	2.20447
269.52	2.70473
275.51	3.19419
281.77	3.64398
288.33	3.76054
295.19	3.61489
302.39	3.44906
309.95	3.31344

317.9	3.20835
326.26	3.12868
335.08	3.06922
344.39	3.03021
354.23	3.00803
364.65	3.00391
375.7	3.0177
387.44	3.05147
399.94	3.10794
413.27	3.19676
427.52	3.33715
442.79	3.62619
459.19	3.91057
476.85	4.02061
495.92	4.36428
516.58	4.46584
539.04	4.33101
563.55	4.19693
590.38	4.088
619.9	3.99492
652.53	3.91691
688.78	3.85047
729.29	3.79789
774.87	3.7548
826.53	3.71371

Wavelength $\lambda$ (nm)	Extinction coefficient $k$ (-)
206.63	2.11156
210.14	2.0839
213.76	2.10187
217.51	2.16303
221.39	2.24788
225.42	2.34385
229.59	2.44918
233.92	2.55542
238.42	2.64646
243.10	2.73222
247.96	2.87148
253.02	3.08079
258.29	3.34857
263.79	3.57501
269.52	3.58114
275.51	3.44469
281.77	3.04214
288.33	2.47824
295.19	2.09868
302.39	1.90342
309.95	1.79858
317.90	1.74342
326.26	1.71862
335.08	1.71526
344.39	1.72777
354.23	1.75364
364.65	1.78983
375.70	1.83617
387.44	1.89089
399.94	1.9566
413.27	2.03378
427.52	2.12921
442.79	2.20755

459.19	2.01582
476.85	1.88529
495.92	1.78632
516.58	1.28285
539.04	0.99076
563.55	0.81071
590.38	0.71184
619.90	0.63355
652.53	0.57201
688.78	0.5302
729.29	0.49291
774.87	0.46314
826.53	0.43205

#### **InGaAs (Gallium indium arsenide)**

Wavelength $\lambda$ (nm)	Refractive index $n$ (-)
206.7	1.22
210.2	1.22
213.8	1.24
217.5	1.24
221.4	1.25
225.5	1.26
229.6	1.30
234.0	1.33
238.5	1.41
243.1	1.50
248.0	1.64
253.1	1.83
258.3	2.08
263.8	2.47
270.0	2.82
275.6	3.16
281.8	3.37
288.4	3.44
295.2	3.45
302.4	3.41
310	3.32
317.9	3.28
326.3	3.23
335.1	3.21
344.4	3.20
354.3	3.20
364.7	3.23
375.8	3.24
387.5	3.30
400	3.38
413.3	3.51
427.6	3.72
442.9	3.89
459.3	4.08
476.9	4.30
496	4.48
516.7	4.44
539.1	4.33
563.6	4.21
590.5	4.10
620.0	4.02
652.6	3.94
688.9	3.87
729.4	3.81

775.0	3.75
826.7	3.71
1000	3.66
1020.6	3.65
1200.4	3.635
1301.2	3.62
1401.1	3.615
1501.2	3.6
1600	3.59
1701	3.58
1800	3.51
1901.8	3.27

Wavelength $\lambda$ (nm)	Extinction coefficient $k$ (-)
206.7	2.13
210.2	2.16
213.8	2.20
217.5	2.26
221.4	2.33
225.5	2.43
229.6	2.52
234.0	2.60
238.5	2.73
243.1	2.87
248.0	3.02
253.1	3.18
258.3	3.31
263.8	3.39
270.0	3.29
275.6	3.05
281.8	2.83
288.4	2.54
295.2	2.34
302.4	2.16
310	2.02
317.9	1.95
326.3	1.91
335.1	1.87
344.4	1.87
354.3	1.87
364.7	1.88
375.8	1.91
387.5	1.95
400	2.00
413.3	2.06
427.6	2.09
442.9	2.01
459.3	1.85
476.9	1.67
496	1.22
516.7	0.89
539.1	0.71
563.6	0.61
590.5	0.55
620.0	0.48
652.6	0.44
688.9	0.41
729.4	0.40
775.0	0.38
826.7	0.36

1000	0.28
1020.6	0.26
1200.4	0.22
1301.2	0.19
1401.1	0.17
1501.2	0.08
1600	0.07
1701	0.05
1800	0
1901.8	0

#### **InGaAs24P76 (Gallium indium phosphide arsenide)**

Wavelength $\lambda$ (nm)	Refractive index $n$ (-)
206.7	1.24
210.2	1.25
213.8	1.28
217.5	1.28
221.4	1.33
225.5	1.36
229.6	1.38
234.0	1.43
238.5	1.50
243.1	1.75
248.0	2.01
253.1	2.33
258.3	2.70
263.8	3.03
270.0	3.47
275.6	3.57
281.8	3.49
288.4	3.38
295.2	3.28
302.4	3.21
310	3.17
317.9	3.13
326.3	3.12
335.1	3.12
344.4	3.11
354.3	3.16
364.7	3.25
375.8	3.41
387.5	3.61
400	3.89
413.3	4.23
427.6	4.37
442.9	4.32
459.3	4.22
476.9	4.11
496	4.00
516.7	3.91
539.1	3.84
563.6	3.76
590.5	3.71
620.0	3.66
652.6	3.61
688.9	3.59
729.4	3.54
775.0	3.54
826.7	3.52

Wavelength $\lambda$ (nm)	Extinction coefficient $k$ (-)
206.7	2.10
210.2	2.15
213.8	2.20
217.5	2.28
221.4	2.339
225.5	2.48
229.6	2.58
234.0	2.69
238.5	2.87
243.1	3.12
248.0	3.29
253.1	3.36
258.3	3.35
263.8	3.26
270.0	2.91
275.6	2.50
281.8	2.20
288.4	2.00
295.2	1.90
302.4	1.83
310	1.81
317.9	1.81
326.3	1.81
335.1	1.82
344.4	1.83
354.3	1.89
364.7	1.95
375.8	2.02
387.5	2.10
400	2.02
413.3	1.81
427.6	1.42
442.9	1.03
459.3	0.84
476.9	0.67
496	0.55
516.7	0.47
539.1	0.40
563.6	0.37
590.5	0.33
620.0	0.29
652.6	0.26
688.9	0.25
729.4	0.22
775.0	0.21
826.7	0.19

**InGaAs<sub>42</sub>P<sub>58</sub> (Gallium indium phosphide arsenide)**

Wavelength $\lambda$ (nm)	Refractive index $n$ (-)
206.7	1.31
210.2	1.32
213.8	1.31
217.5	1.33
221.4	1.34
225.5	1.37
229.6	1.42
234.0	1.48
238.5	1.57

243.1	1.65
248.0	1.83
253.1	2.13
258.3	2.52
263.8	2.94
270.0	3.34
275.6	3.50
281.8	3.49
288.4	3.45
295.2	3.40
302.4	3.33
310	3.27
317.9	3.24
326.3	3.22
335.1	3.20
344.4	3.21
354.3	3.23
364.7	3.29
375.8	3.35
387.5	3.48
400	3.71
413.3	4.01
427.6	4.23
442.9	4.39
459.3	4.35
476.9	4.24
496	4.12
516.7	4.02
539.1	3.93
563.6	3.85
590.5	3.78
620.0	3.71
652.6	3.65
688.9	3.60
729.4	3.59
775.0	3.56
826.7	3.55

Wavelength $\lambda$ (nm)	Extinction coefficient $k$ (-)
206.7	2.14
210.2	2.20
213.8	2.25
217.5	2.33
221.4	2.40
225.5	2.49
229.6	2.59
234.0	2.69
238.5	2.84
243.1	3.01
248.0	3.18
253.1	3.31
258.3	3.37
263.8	3.23
270.0	3.00
275.6	2.69
281.8	2.39
288.4	2.16
295.2	2.01
302.4	1.92
310	1.86



317.9	1.83
326.3	1.81
335.1	1.81
344.4	1.82
354.3	1.87
364.7	1.91
375.8	1.97
387.5	2.03
400	1.99
413.3	1.88
427.6	1.70
442.9	1.34
459.3	1.03
476.9	0.80
496	0.64
516.7	0.56
539.1	0.48
563.6	0.41
590.5	0.37
620.0	0.34
652.6	0.33
688.9	0.30
729.4	0.28
775.0	0.26
826.7	0.25

#### **InGaAs55P45 (Gallium indium phosphide arsenide)**

Wavelength $\lambda$ (nm)	Refractive index $n$ (-)
206.7	1.31
210.2	1.31
213.8	1.31
217.5	1.32
221.4	1.34
225.5	1.36
229.6	1.38
234.0	1.44
238.5	1.52
243.1	1.65
248.0	1.78
253.1	2.03
258.3	2.39
263.8	2.78
270.0	3.15
275.6	3.43
281.8	3.48
288.4	3.47
295.2	3.43
302.4	3.36
310	3.31
317.9	3.27
326.3	3.25
335.1	3.23
344.4	3.22
354.3	3.23
364.7	3.27
375.8	3.33
387.5	3.44
400	3.62
413.3	3.84

427.6	4.11
442.9	4.32
459.3	4.41
476.9	4.35
496	4.25
516.7	4.14
539.1	4.03
563.6	3.94
590.5	3.86
620.0	3.80
652.6	3.73
688.9	3.68
729.4	3.64
775.0	3.60
826.7	3.59

Wavelength $\lambda$ (nm)	Extinction coefficient $k$ (-)
206.7	2.14
210.2	2.20
213.8	2.25
217.5	2.33
221.4	2.39
225.5	2.48
229.6	2.56
234.0	2.67
238.5	2.82
243.1	3.01
248.0	3.15
253.1	3.24
258.3	3.27
263.8	3.25
270.0	3.09
275.6	2.86
281.8	2.56
288.4	2.33
295.2	2.15
302.4	2.02
310	1.94
317.9	1.89
326.3	1.87
335.1	1.86
344.4	1.85
354.3	1.86
364.7	1.89
375.8	1.93
387.5	1.97
400	1.99
413.3	1.95
427.6	1.82
442.9	1.60
459.3	1.25
476.9	0.92
496	0.73
516.7	0.61
539.1	0.52
563.6	0.47
590.5	0.42
620.0	0.39
652.6	0.37
688.9	0.33

729.4	0.32
775.0	0.30
826.7	0.29

**InGaAs82P18 (Gallium indium phosphide arsenide)**

Wavelength  $\lambda$  (nm)      Refractive index  $n$  (-)

206.7	1.26
210.2	1.26
213.8	1.27
217.5	1.28
221.4	1.30
225.5	1.35
229.6	1.35
234.0	1.41
238.5	1.47
243.1	1.57
248.0	1.73
253.1	2.00
258.3	2.30
263.8	2.66
270.0	3.00
275.6	3.29
281.8	3.46
288.4	3.48
295.2	3.44
302.4	3.38
310	3.32
317.9	3.28
326.3	3.23
335.1	3.21
344.4	3.21
354.3	3.21
364.7	3.24
375.8	3.31
387.5	3.37
400	3.49
413.3	3.66
427.6	3.88
442.9	4.08
459.3	4.26
476.9	4.44
496	4.43
516.7	4.30
539.1	4.18
563.6	4.08
590.5	3.99
620.0	3.91
652.6	3.85
688.9	3.78
729.4	3.73
775.0	3.69
826.7	3.65

Wavelength  $\lambda$  (nm)      Extinction coefficient  $k$  (-)

206.7	2.17
210.2	2.19
213.8	2.25
217.5	2.32
221.4	2.40

225.5	2.51
229.6	2.61
234.0	2.72
238.5	2.85
243.1	2.98
248.0	3.11
253.1	3.26
258.3	3.37
263.8	3.32
270.0	3.17
275.6	2.94
281.8	2.71
288.4	2.45
295.2	2.25
302.4	2.09
310	2.00
317.9	1.93
326.3	1.91
335.1	1.87
344.4	1.87
354.3	1.88
364.7	1.90
375.8	1.94
387.5	1.97
400	2.02
413.3	2.07
427.6	1.99
442.9	1.85
459.3	1.67
476.9	1.36
496	1.01
516.7	0.77
539.1	0.63
563.6	0.55
590.5	0.48
620.0	0.43
652.6	0.40
688.9	0.37
729.4	0.34
775.0	0.33
826.7	0.32

#### **InP (Indium phosphide)**

Wavelength $\lambda$ (nm)	Refractive index $n$ (-)
206.63	1.336
210.14	1.301
213.76	1.299
217.51	1.325
221.39	1.375
225.42	1.426
229.59	1.455
233.92	1.482
238.42	1.558
243.1	1.745
247.96	2.131
253.02	2.546
258.29	2.984
263.79	3.56
269.52	3.8
275.51	3.697

281.77	3.527
288.33	3.384
295.19	3.275
302.39	3.196
309.95	3.141
317.9	3.108
326.26	3.095
335.08	3.103
344.39	3.133
354.23	3.193
364.65	3.299
375.7	3.576
387.44	3.976
399.94	4.415
413.27	4.395
427.52	4.256
442.79	4.121
459.19	4.004
476.85	3.903
495.92	3.818
516.58	3.745
539.04	3.682
563.55	3.629
590.38	3.585
619.9	3.549
652.53	3.517
688.78	3.492
729.29	3.476
774.87	3.467
826.53	3.456
885.57	3.4186
953.69	3.362
1033.17	3.297
1127.09	3.254
1239.8	3.22
1377.56	3.191
1549.75	3.167
1771.14	3.146
2066.33	3.129

Wavelength $\lambda$ (nm)	Extinction coefficient $k$ (-)
206.63	2.113
210.14	2.183
213.76	2.28
217.51	2.383
221.39	2.484
225.42	2.562
229.59	2.652
233.92	2.802
238.42	3.016
243.10	3.291
247.96	3.495
253.02	3.514
258.29	3.517
263.79	3.223
269.52	2.637
275.51	2.186
281.77	1.948
288.33	1.826
295.19	1.762

302.39	1.735
309.95	1.73
317.90	1.744
326.26	1.773
335.08	1.816
344.39	1.872
354.23	1.948
364.65	2.06
375.70	2.209
387.44	2.143
399.94	1.735
413.27	1.247
427.52	0.964
442.79	0.786
459.19	0.667
476.85	0.579
495.92	0.511
516.58	0.457
539.04	0.416
563.55	0.38
590.38	0.347
619.90	0.317
652.53	0.293
688.78	0.27
729.29	0.242
774.87	0.218
826.53	0.203
885.57	0.109
953.69	0.00028
1033.17	0
1127.09	0
1239.80	0
1377.56	0
1549.75	0
1771.14	0
2066.33	0

#### **InSb (Indium antimonide)**

Wavelength $\lambda$ (nm)	Refractive index $n$ (-)
206.63	1.23
208.04	.941
209.47	.9
210.92	.933
212.39	.952
213.88	.97
215.39	.987
216.92	.997
218.47	1.007
220.05	1.017
221.65	1.027
223.27	1.038
224.92	1.052
226.59	1.07
228.29	1.094
230.01	1.123
231.76	1.153
233.53	1.187
235.33	1.22
237.16	1.251
239.02	1.278

240.91	1.299
242.83	1.308
244.78	1.311
246.76	1.31
248.77	1.305
250.81	1.301
252.89	1.301
255.01	1.304
257.16	1.308
259.35	1.316
261.57	1.328
263.83	1.341
266.14	1.358
268.48	1.376
270.86	1.397
273.29	1.421
275.76	1.446
278.28	1.473
280.84	1.503
283.45	1.538
286.11	1.578
288.82	1.627
291.58	1.687
294.39	1.765
297.26	1.868
300.19	2.003
303.17	2.176
306.22	2.379
309.32	2.591
312.49	2.786
315.73	2.952
319.03	3.086
322.4	3.191
325.84	3.278
329.36	3.348
332.96	3.403
336.63	3.441
340.39	3.467
344.23	3.484
348.16	3.498
352.18	3.508
356.3	3.513
360.51	3.515
364.82	3.52
369.24	3.527
373.76	3.527
378.4	3.518
383.15	3.5
388.03	3.479
393.03	3.454
398.16	3.428
403.43	3.402
408.83	3.38
414.39	3.363
420.1	3.351
425.96	3.343
432	3.34
438.21	3.341
444.59	3.347
451.17	3.357

457.94	3.373
464.92	3.395
472.12	3.424
479.55	3.461
487.21	3.506
495.11	3.563
503.29	3.639
511.73	3.743
520.46	3.892
529.5	4.036
538.85	4.11
548.54	4.133
558.59	4.136
569.01	4.134
579.83	4.132
591.07	4.137
602.75	4.151
614.9	4.178
627.55	4.224
640.74	4.302
654.49	4.467
668.84	4.766
683.84	4.906
699.52	4.885
715.94	4.815
733.15	4.735
751.21	4.657
770.18	4.585
790.13	4.516
811.15	4.455
833.31	4.408
856.72	4.393
881.48	4.398
907.71	4.38
935.55	4.35
965.16	4.315
996.7	4.279
1030.37	4.243
1066.4	4.209
1105.04	4.181
1146.58	4.16
1191.37	4.149
1239.8	4.15

Wavelength $\lambda$ (nm)	Extinction coefficient $k$ (-)
206.63	1.91
208.04	2.141
209.47	2.191
210.92	2.192
212.39	2.204
213.88	2.211
215.39	2.222
216.92	2.232
218.47	2.243
220.05	2.259
221.65	2.278
223.27	2.3
224.92	2.325
226.59	2.35
228.29	2.375



230.01	2.4
231.76	2.42
233.53	2.433
235.33	2.442
237.16	2.446
239.02	2.442
240.91	2.436
242.83	2.431
244.78	2.429
246.76	2.434
248.77	2.447
250.81	2.468
252.89	2.493
255.01	2.524
257.16	2.558
259.35	2.593
261.57	2.63
263.83	2.67
266.14	2.712
268.48	2.756
270.86	2.802
273.29	2.849
275.76	2.899
278.28	2.954
280.84	3.012
283.45	3.076
286.11	3.146
288.82	3.224
291.58	3.31
294.39	3.405
297.26	3.507
300.19	3.605
303.17	3.682
306.22	3.719
309.32	3.703
312.49	3.641
315.73	3.549
319.03	3.442
322.40	3.329
325.84	3.217
329.36	3.105
332.96	2.995
336.63	2.89
340.39	2.794
344.23	2.708
348.16	2.628
352.18	2.553
356.30	2.484
360.51	2.423
364.82	2.367
369.24	2.307
373.76	2.244
378.40	2.184
383.15	2.132
388.03	2.088
393.03	2.049
398.16	2.022
403.43	2.005
408.83	1.996
414.39	1.994

420.10	1.996
425.96	2.002
432.00	2.012
438.21	2.025
444.59	2.041
451.17	2.058
457.94	2.079
464.92	2.102
472.12	2.128
479.55	2.155
487.21	2.184
495.11	2.218
503.29	2.251
511.73	2.282
520.46	2.276
529.50	2.187
538.85	2.062
548.54	1.957
558.59	1.879
569.01	1.825
579.83	1.789
591.07	1.769
602.75	1.763
614.90	1.768
627.55	1.787
640.74	1.824
654.49	1.879
668.84	1.78
683.84	1.484
699.52	1.233
715.94	1.052
733.15	0.925
751.21	0.828
770.18	0.762
790.13	0.711
811.15	0.665
833.31	0.626
856.72	0.537
881.48	0.42
907.71	0.358
935.55	0.328
965.16	0.315
996.70	0.314
1030.37	0.319
1066.40	0.326
1105.04	0.329
1146.58	0.322
1191.37	0.301
1239.80	0.26

#### ITO (Indium tin oxide)

Wavelength $\lambda$ (nm)	Refractive index $n$ (-)
201.4	1.36581897735596
202.8	1.34253096580505
204.2	1.31741166114807
205.6	1.29023230075836
207	1.26072239875793
208.4	1.2285635471344
209.8	1.19337594509125

211.2	1.154709815979
212.6	1.11202681064606
214	1.0646915435791
215.4	1.01197385787964
216.8	.953088164329529
218.2	.887361526489258
219.6	.814700961112976
221	.736759185791016
222.4	.658925354480743
223.8	.590873897075653
225.2	.541329085826874
226.6	.512162446975708
228	.500448226928711
229.4	.502888679504395
230.8	.51750922203064
232.2	.543749332427979
233.6	.582300782203674
235	.635081708431244
236.4	.705440938472748
237.8	.798613548278809
239.2	.922500133514404
240.6	1.08881652355194
242	1.31442320346832
243.4	1.62162089347839
244.8	2.03304624557495
246.2	2.55083060264587
247.6	3.11509251594543
249	3.59118580818176
250.4	3.86518788337708
251.8	3.94043159484863
253.2	3.89202046394348
254.6	3.78798055648804
256	3.6673219203949
257.4	3.54809856414795
258.8	3.43740749359131
260.2	3.33732175827026
261.6	3.2477912902832
263	3.16794800758362
264.4	3.09669637680054
265.8	3.03294563293457
267.2	2.97570490837097
268.6	2.92410802841187
270	2.8774106502533
271.4	2.83497881889343
272.8	2.7962760925293
274.2	2.7608437538147
275.6	2.72829413414001
277	2.69829368591309
278.4	2.67055773735046
279.8	2.64484047889709
281.2	2.62093067169189
282.6	2.59864401817322
284	2.57782077789307
285.4	2.55832099914551
286.8	2.54002046585083
288.2	2.52281165122986
289.6	2.50659799575806
291	2.49129462242126
292.4	2.47682595252991
293.8	2.46312379837036

295.2	2.45012831687927
296.6	2.43778467178345
298	2.42604374885559
299.4	2.41486144065857
300.8	2.40419721603394
302.2	2.3940155506134
303.6	2.38428211212158
305	2.3749680519104
306.4	2.36604523658752
307.8	2.35748863220215
309.2	2.3492751121521
310.6	2.34138369560242
312	2.33379435539246
313.4	2.32648968696594
314.8	2.31945300102234
316.2	2.312668800354
317.6	2.30612254142761
319	2.29980158805847
320.4	2.29369401931763
321.8	2.28778791427612
323.2	2.28207278251648
324.6	2.27653884887695
326	2.27117681503296
327.4	2.26597809791565
328.8	2.26093459129334
330.2	2.25603914260864
331.6	2.2512845993042
333	2.24666380882263
334.4	2.24217128753662
335.8	2.23780059814453
337.2	2.2335467338562
338.6	2.22940421104431
340	2.2253680229187
341.4	2.22143387794495
342.8	2.21759724617004
344.2	2.21385383605957
345.6	2.21020030975342
347	2.20663237571716
348.4	2.20314693450928
349.8	2.19974040985107
351.2	2.19641017913818
352.6	2.19315242767334
354	2.18996500968933
355.4	2.18684506416321
356.8	2.18378973007202
358.2	2.18079733848572
359.6	2.17786478996277
361	2.17499017715454
362.4	2.17217135429382
363.8	2.1694061756134
365.2	2.16669321060181
366.6	2.16403007507324
368	2.16141510009766
369.4	2.15884709358215
370.8	2.1563241481781
372.2	2.15384435653687
373.6	2.15140676498413
375	2.14900970458984
376.4	2.14665198326111
377.8	2.14433264732361

379.2	2.14204955101013
380.6	2.1398024559021
382	2.13758945465088
383.4	2.13540983200073
384.8	2.13326287269592
386.2	2.1311469078064
387.6	2.129061460495
389	2.12700533866882
390.4	2.12497735023499
391.8	2.1229772567749
393.2	2.12100410461426
394.6	2.11905670166016
396	2.11713457107544
397.4	2.11523699760437
398.8	2.11336302757263
400.2	2.11151218414307
401.6	2.10968399047852
403	2.10787725448608
404.4	2.10609173774719
405.8	2.1043267250061
407.2	2.10258173942566
408.6	2.10085582733154
410	2.09914898872375
411.4	2.09746050834656
412.8	2.09578967094421
414.2	2.09413623809814
415.6	2.09249973297119
417	2.09087944030762
418.4	2.08927512168884
419.8	2.08768630027771
421.2	2.08611249923706
422.6	2.08455348014832
424	2.08300876617432
425.4	2.08147788047791
426.8	2.0799605846405
428.2	2.07845664024353
429.6	2.07696533203125
431	2.07548642158508
432.4	2.07401990890503
433.8	2.07256507873535
435.2	2.07112169265747
436.6	2.06968975067139
438	2.06826853752136
439.4	2.06685853004456
440.8	2.06545829772949
442.2	2.06406831741333
443.6	2.06268858909607
445	2.06131792068481
446.4	2.0599570274353
447.8	2.0586051940918
449.2	2.05726218223572
450.6	2.05592799186707
452	2.0546019077301
453.4	2.05328440666199
454.8	2.05197477340698
456.2	2.05067300796509
457.6	2.04937887191772
459	2.04809212684631
460.4	2.04681277275085
461.8	2.04554033279419

463.2	2.04427480697632
464.6	2.04301619529724
466	2.04176378250122
467.4	2.04051780700684
468.8	2.03927803039551
470.2	2.03804445266724
471.6	2.03681683540344
473	2.03559470176697
474.4	2.03437852859497
475.8	2.03316736221313
477.2	2.03196215629578
478.6	2.03076171875
480	2.02956628799438
481.4	2.02837586402893
482.8	2.02719020843506
484.2	2.02600932121277
485.6	2.02483296394348
487	2.02366089820862
488.4	2.02249336242676
489.8	2.02132987976074
491.2	2.02017045021057
492.6	2.01901507377625
494	2.01786351203918
495.4	2.01671600341797
496.8	2.01557183265686
498.2	2.01443147659302
499.6	2.01329445838928
501	2.01216101646423
502.4	2.01103043556213
503.8	2.00990343093872
505.2	2.00877952575684
506.6	2.00765824317932
508	2.00654029846191
509.4	2.00542497634888
510.8	2.00431251525879
512.2	2.00320291519165
513.6	2.0020956993103
515	2.00099110603333
516.4	1.99988889694214
517.8	1.99878919124603
519.2	1.99769175052643
520.6	1.99659657478333
522	1.99550342559814
523.4	1.99441254138947
524.8	1.99332356452942
526.2	1.99223661422729
527.6	1.9911515712738
529	1.99006831645966
530.4	1.98898684978485
531.8	1.98790693283081
533.2	1.98682904243469
534.6	1.98575258255005
536	1.98467767238617
537.4	1.98360419273376
538.8	1.98253214359283
540.2	1.98146152496338
541.6	1.98039209842682
543	1.97932398319244
544.4	1.97825741767883
545.8	1.97719156742096

547.2	1.97612690925598
548.6	1.9750634431839
550	1.97400104999542
551.4	1.97293949127197
552.8	1.97187876701355
554.2	1.97081911563873
555.6	1.96976017951965
557	1.9687020778656
558.4	1.96764469146729
559.8	1.96658802032471
561.2	1.96553218364716
562.6	1.96447670459747
564	1.96342194080353
565.4	1.96236765384674
566.8	1.96131384372711
568.2	1.96026062965393
569.6	1.95920765399933
571	1.9581550359726
572.4	1.95710277557373
573.8	1.95605099201202
575.2	1.9549994468689
576.6	1.95394814014435
578	1.95289695262909
579.4	1.95184588432312
580.8	1.95079505443573
582.2	1.94974434375763
583.6	1.94869375228882
585	1.94764304161072
586.4	1.94659245014191
587.8	1.94554173946381
589.2	1.94449102878571
590.6	1.94344019889832
592	1.94238924980164
593.4	1.94133818149567
594.8	1.94028699398041
596.2	1.93923556804657
597.6	1.93818390369415
599	1.93713200092316
600.4	1.93607974052429
601.8	1.93502712249756
603.2	1.93397426605225
604.6	1.93292105197906
606	1.93186736106873
607.4	1.93081343173981
608.8	1.92975890636444
610.2	1.92870390415192
611.6	1.92764854431152
613	1.92659246921539
614.4	1.92553603649139
615.8	1.92447900772095
617.2	1.92342126369476
618.6	1.92236292362213
620	1.92130410671234
621.4	1.92024445533752
622.8	1.91918432712555
624.2	1.91812324523926
625.6	1.91706156730652
627	1.91599917411804
628.4	1.91493594646454
629.8	1.9138720035553

631.2	1.91280722618103
632.6	1.91174173355103
634	1.91067516803741
635.4	1.90960788726807
636.8	1.9085396528244
638.2	1.90747058391571
639.6	1.90640044212341
641	1.90532958507538
642.4	1.90425765514374
643.8	1.90318477153778
645.2	1.90211069583893
646.6	1.90103590488434
648	1.89995980262756
649.4	1.89888286590576
650.8	1.89780473709106
652.2	1.89672553539276
653.6	1.89564526081085
655	1.89456379413605
656.4	1.89348125457764
657.8	1.89239764213562
659.2	1.89131259918213
660.6	1.89022660255432
662	1.88913917541504
663.4	1.88805079460144
664.8	1.88696098327637
666.2	1.88587009906769
667.6	1.88477778434753
669	1.88368427753448
670.4	1.88258934020996
671.8	1.88149333000183
673.2	1.88039565086365
674.6	1.87929701805115
676	1.87819671630859
677.4	1.87709522247314
678.8	1.87599217891693
680.2	1.87488794326782
681.6	1.87378215789795
683	1.87267482280731
684.4	1.87156641483307
685.8	1.87045609951019
687.2	1.86934459209442
688.6	1.86823153495789
690	1.86711692810059
691.4	1.86600089073181
692.8	1.86488330364227
694.2	1.86376416683197
695.6	1.8626434803009
697	1.86152124404907
698.4	1.86039733886719
699.8	1.85927188396454
701.2	1.85814487934113
702.6	1.85701632499695
704	1.85588598251343
705.4	1.85475420951843
706.8	1.85362040996552
708.2	1.85248529911041
709.6	1.85134828090668
711	1.85020983219147
712.4	1.84906947612762
713.8	1.84792768955231



715.2	1.84678375720978
716.6	1.84563839435577
718	1.84449124336243
719.4	1.84334206581116
720.8	1.84219133853912
722.2	1.84103894233704
723.6	1.83988451957703
725	1.83872842788696
726.4	1.83757054805756
727.8	1.83641088008881
729.2	1.83524918556213
730.6	1.83408558368683
732	1.83292031288147
733.4	1.83175313472748
734.8	1.83058416843414
736.2	1.82941317558289
737.6	1.828240275383
739	1.82706546783447
740.4	1.82588875293732
741.8	1.82471013069153
743.2	1.82352948188782
744.6	1.82234692573547
746	1.8211624622345
747.4	1.81997609138489
748.8	1.81878745555878
750.2	1.81759703159332
751.6	1.81640446186066
753	1.81521010398865
754.4	1.81401348114014
755.8	1.81281495094299
757.2	1.81161439418793
758.6	1.81041169166565
760	1.80920696258545
761.4	1.80800008773804
762.8	1.8067911863327
764.2	1.80558025836945
765.6	1.8043669462204
767	1.80315184593201
768.4	1.80193448066711
769.8	1.80071496963501
771.2	1.79949343204498
772.6	1.79826962947845
774	1.79704356193542
775.4	1.79581546783447
776.8	1.79458510875702
778.2	1.79335272312164
779.6	1.79211795330048
781	1.79088091850281
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783.8	1.78840041160583
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1588.8	.45724755525589
1590.2	.455815941095352
1591.6	.454405456781387
1593	.453016132116318
1594.4	.451647698879242
1595.8	.450299799442291
1597.2	.448972135782242
1598.6	.447664648294449
1600	.446376621723175

Wavelength $\lambda$ (nm)	Extinction coefficient $k$ (-)
201.4	5.50407581031322E-02
202.8	.060247827321291
204.2	6.61738216876984E-02
205.6	7.29600116610527E-02
207	8.07860717177391E-02
208.4	8.98831784725189E-02
209.8	.100554630160332
211.2	.113204590976238
212.6	.128384754061699
214	.146865576505661
215.4	.169750198721886
216.8	.198661774396896
218.2	.236030355095863
219.6	.285485655069351
221	.352063089609146
222.4	.441064149141312
223.8	.553943514823914
225.2	.684831500053406
226.6	.824997842311859
228	.969071865081787
229.4	1.11556482315063
230.8	1.26506614685059
232.2	1.41903257369995
233.6	1.57928681373596
235	1.74780452251434

236.4	1.92661547660828
237.8	2.11757040023804
239.2	2.3218252658844
240.6	2.53860759735107
242	2.76241970062256
243.4	2.97714495658875
244.8	3.14562344551086
246.2	3.19938826560974
247.6	3.05528926849365
249	2.69207048416138
250.4	2.20924758911133
251.8	1.74333882331848
253.2	1.36427617073059
254.6	1.07792925834656
256	.866110444068909
257.4	.708770573139191
258.8	.590193331241608
260.2	.499224454164505
261.6	.42816823720932
263	.371710032224655
264.4	.32614678144455
265.8	.288853913545609
267.2	.257942378520966
268.6	.232028022408485
270	.210080876946449
271.4	.191322222352028
272.8	.175156325101852
274.2	.161119416356087
275.6	.148848488926888
277	.138053923845291
278.4	.128504261374474
279.8	.120011553168297
281.2	.112422451376915
282.6	.105610631406307
284	9.94715765118599E-02
285.4	9.39174816012383E-02
286.8	8.88747349381447E-02
288.2	8.42810571193695E-02
289.6	8.00835713744164E-02
291	7.62368962168694E-02
292.4	7.27021768689156E-02
293.8	6.94457516074181E-02
295.2	6.64385929703712E-02
296.6	.063655249774456
298	6.10735677182674E-02
299.4	5.86740374565125E-02
300.8	5.64395748078823E-02
302.2	5.43549694120884E-02
303.6	5.24068549275398E-02
305	5.05833327770233E-02
306.4	4.88737002015114E-02
307.8	.047268521040678
309.2	4.57592979073524E-02
310.6	4.43383418023586E-02
312	4.29987795650959E-02
313.4	.041734367609024
314.8	4.05394956469536E-02
316.2	3.94090861082077E-02
317.6	3.83384637534618E-02
319	.037323459982872

320.4	3.63602265715599E-02
321.8	3.54452505707741E-02
323.2	3.45753133296967E-02
324.6	3.37474793195724E-02
326	3.29590663313866E-02
327.4	3.22075560688972E-02
328.8	3.14906761050224E-02
330.2	3.08063421398401E-02
331.6	3.01525872200727E-02
333	2.95276343822479E-02
334.4	2.89297942072153E-02
335.8	2.83575393259525E-02
337.2	2.78094299137592E-02
338.6	2.72841397672892E-02
340	2.67804246395826E-02
341.4	2.62971464544535E-02
342.8	2.58332323282957E-02
344.2	2.53876764327288E-02
345.6	2.49595288187265E-02
347	2.45479382574558E-02
348.4	2.41520684212446E-02
349.8	2.37711668014526E-02
351.2	2.34044957906008E-02
352.6	2.30513885617256E-02
354	2.27112174034119E-02
355.4	2.23833862692118E-02
356.8	2.20673326402903E-02
358.2	.021762527525425
359.6	2.14684791862965E-02
361	2.11847051978111E-02
362.4	2.09107734262943E-02
363.8	2.06462685018778E-02
365.2	2.03907955437899E-02
366.6	2.01439764350653E-02
368	1.99054609984159E-02
369.4	1.96749102324247E-02
370.8	1.94520186632872E-02
372.2	1.92364770919085E-02
373.6	1.90280023962259E-02
375	1.88263226300478E-02
376.4	1.86311844736338E-02
377.8	1.84423439204693E-02
379.2	1.82595681399107E-02
380.6	1.80826392024755E-02
382	1.79113429039717E-02
383.4	1.77454836666584E-02
384.8	1.75848659127951E-02
386.2	.017429307103157
387.6	1.72786433249712E-02
389	1.71327032148838E-02
390.4	1.69913377612829E-02
391.8	1.68543811887503E-02
393.2	1.67217012494802E-02
394.6	1.65931545197964E-02
396	1.64686162024736E-02
397.4	1.63479503244162E-02
398.8	1.62310469895601E-02
400.2	.016117786988616
401.6	1.60080604255199E-02
403	1.59017629921436E-02

404.4	1.57987885177135E-02
405.8	1.56990420073271E-02
407.2	1.56024368479848E-02
408.6	1.55088752508163E-02
410	1.54182743281126E-02
411.4	1.53305539861321E-02
412.8	1.52456313371658E-02
414.2	.015163435600698
415.6	1.50838866829872E-02
417	.015006922185421
418.4	1.49324676021934E-02
419.8	1.48604633286595E-02
421.2	1.47908441722393E-02
422.6	1.47235505282879E-02
424	1.46585246548057E-02
425.4	.014595708809793
426.8	.014535054564476
428.2	1.44765023142099E-02
429.6	1.44200092181563E-02
431	1.43655259162188E-02
432.4	1.43130021169782E-02
433.8	1.42623949795961E-02
435.2	.014213664457202
436.6	1.41667621210217E-02
438	1.41216591000557E-02
439.4	1.40783032402396E-02
440.8	1.40366647392511E-02
442.2	1.39967072755098E-02
443.6	1.39583926647902E-02
445	1.39216901734471E-02
446.4	1.38865644112229E-02
447.8	1.38529855757952E-02
449.2	1.38209238648415E-02
450.6	1.37903457507491E-02
452	1.37612288817763E-02
453.4	1.37335387989879E-02
454.8	1.37072550132871E-02
456.2	.013682346791029
457.6	1.36587880551815E-02
459	1.36365629732609E-02
460.4	1.36156398802996E-02
461.8	1.35960010811687E-02
463.2	1.35776186361909E-02
464.6	1.35604757815599E-02
466	1.35445510968566E-02
467.4	1.35298240929842E-02
468.8	1.35162752121687E-02
470.2	.013503884896636
471.6	1.34926363825798E-02
473	1.34825110435486E-02
474.4	.013473492115736
475.8	1.34655628353357E-02
477.2	1.34587055072188E-02
478.6	1.34529052302241E-02
480	1.34481498971581E-02
481.4	1.34444208815694E-02
482.8	.013441707007587
484.2	1.34399905800819E-02
485.6	1.34392604231834E-02
487	1.34395034983754E-02

488.4	1.34407058358192E-02
489.8	1.34428581222892E-02
491.2	1.34459445253015E-02
492.6	1.34499557316303E-02
494	1.34548787027597E-02
495.4	1.34607004001737E-02
496.8	1.34674208238721E-02
498.2	1.34750157594681E-02
499.6	1.34834861382842E-02
501	1.34928142651916E-02
502.4	1.35029964148998E-02
503.8	.013514019548893
505.2	1.35258752852678E-02
506.6	1.35385561734438E-02
508	1.35520538315177E-02
509.4	1.35663617402315E-02
510.8	1.35814659297466E-02
512.2	1.35973626747727E-02
513.6	1.36140463873744E-02
515	1.36315049603581E-02
516.4	1.36497346684337E-02
517.8	1.36687280610204E-02
519.2	1.36884776875377E-02
520.6	1.37089770287275E-02
522	1.37302223592997E-02
523.4	1.37522025033832E-02
524.8	1.37749155983329E-02
526.2	1.37983551248908E-02
527.6	1.38225117698312E-02
529	1.38473864644766E-02
530.4	1.38729671016335E-02
531.8	1.38992592692375E-02
533.2	1.39262415468693E-02
534.6	.013953922316432
536	1.39822922646999E-02
537.4	1.40113458037376E-02
538.8	1.40410801395774E-02
540.2	1.40714915469289E-02
541.6	1.41025735065341E-02
543	1.41343269497156E-02
544.4	1.41667379066348E-02
545.8	1.41998138278723E-02
547.2	1.42335444688797E-02
548.6	1.42679261043668E-02
550	1.43029578030109E-02
551.4	1.43386349081993E-02
552.8	1.43749546259642E-02
554.2	1.44119132310152E-02
555.6	1.44495088607073E-02
557	.014487735927105
558.4	1.45265925675631E-02
559.8	1.45660797134042E-02
561.2	.01460618712008
562.6	1.46469175815582E-02
564	1.46882683038712E-02
565.4	1.47302346304059E-02
566.8	.014772817492485
568.2	.014816009439528
569.6	1.48598132655025E-02
571	1.49042261764407E-02

572.4	1.49492425844073E-02
573.8	1.49948624894023E-02
575.2	1.50410858914256E-02
576.6	1.50879062712193E-02
578	1.51353264227509E-02
579.4	1.51833444833755E-02
580.8	1.52319567278028E-02
582.2	1.52811612933874E-02
583.6	1.53309544548392E-02
585	1.53813408687711E-02
586.4	1.54323130846024E-02
587.8	1.54838757589459E-02
589.2	1.55360233038664E-02
590.6	1.55887557193637E-02
592	1.56420730054379E-02
593.4	1.56959723681211E-02
594.8	1.57504510134459E-02
596.2	1.58055126667023E-02
597.6	1.58611517399549E-02
599	1.59173663705587E-02
600.4	1.59741658717394E-02
601.8	.016031539067626
603.2	1.60894878208637E-02
604.6	1.61480102688074E-02
606	1.62071101367474E-02
607.4	.016266779974103
608.8	.0163270290941
610.2	1.63878481835127E-02
611.6	.016449237242341
613	1.65111999958754E-02
614.4	1.65737364441156E-02
615.8	1.66368428617716E-02
617.2	1.67005155235529E-02
618.6	1.67647656053305E-02
620	1.68295819312334E-02
621.4	1.68949700891972E-02
622.8	1.69609263539314E-02
624.2	1.70274563133717E-02
625.6	1.70945543795824E-02
627	1.71622205525637E-02
628.4	1.72304566949606E-02
629.8	1.72992628067732E-02
631.2	1.73686370253563E-02
632.6	1.74385830760002E-02
634	1.75090972334147E-02
635.4	1.75801794975996E-02
636.8	1.76518373191357E-02
638.2	1.77240613847971E-02
639.6	1.77968572825193E-02
641	1.78702231496572E-02
642.4	.017944160848856
643.8	1.80186703801155E-02
645.2	.018093753606081
646.6	.018169404938817
648	1.82456336915493E-02
649.4	1.83224324136972E-02
650.8	1.83998048305511E-02
652.2	.018477750942111
653.6	.018556272611022
655	1.86353661119938E-02



656.4	1.87150407582521E-02
657.8	1.87952890992165E-02
659.2	.018876114860177
660.6	1.89575143158436E-02
662	1.90395005047321E-02
663.4	1.91220603883266E-02
664.8	1.92052032798529E-02
666.2	1.92889198660851E-02
667.6	1.93732194602489E-02
669	1.94581057876349E-02
670.4	1.95435788482428E-02
671.8	1.96296256035566E-02
673.2	.019716264680028
674.6	1.98034830391407E-02
676	1.98912918567657E-02
677.4	.019979689270258
678.8	2.00686752796173E-02
680.2	2.01582480221987E-02
681.6	2.02484130859375E-02
683	2.03391686081886E-02
684.4	2.04305164515972E-02
685.8	2.05224622040987E-02
687.2	2.06149965524673E-02
688.6	2.07081325352192E-02
690	2.08018627017736E-02
691.4	2.08961926400661E-02
692.8	2.09911204874516E-02
694.2	2.10866555571556E-02
695.6	2.11827866733074E-02
697	2.12795231491327E-02
698.4	2.13768668472767E-02
699.8	2.14748103171587E-02
701.2	2.15733665972948E-02
702.6	2.16725245118141E-02
704	2.17722989618778E-02
705.4	2.18726824969053E-02
706.8	2.19736825674772E-02
708.2	2.20752935856581E-02
709.6	2.21775211393833E-02
711	2.22803633660078E-02
712.4	.022383825853467
713.8	2.24879067391157E-02
715.2	2.25926134735346E-02
716.6	2.26979460567236E-02
718	2.28038970381022E-02
719.4	2.29104794561863E-02
720.8	2.30176914483309E-02
722.2	.023125521838665
723.6	2.32339967042208E-02
725	2.33430974185467E-02
726.4	2.34528295695782E-02
727.8	2.35632061958313E-02
729.2	.02367421425879
730.6	2.37858705222607E-02
732	2.38981638103724E-02
733.4	2.40111015737057E-02
734.8	2.41246782243252E-02
736.2	2.42389086633921E-02
737.6	2.43537910282612E-02
739	2.44693178683519E-02

740.4	2.45855022221804E-02
741.8	2.47023403644562E-02
743.2	2.48198341578245E-02
744.6	2.49379854649305E-02
746	2.50567961484194E-02
747.4	2.51762680709362E-02
748.8	2.52964086830616E-02
750.2	2.54172123968601E-02
751.6	2.55386885255575E-02
753	2.56608296185732E-02
754.4	2.57836449891329E-02
755.8	2.59071364998817E-02
757.2	2.60313022881746E-02
758.6	2.61561535298824E-02
760	2.62816771864891E-02
761.4	2.64078918844461E-02
762.8	.026534790173173
764.2	2.66623739153147E-02
765.6	2.67906505614519E-02
767	2.69196107983589E-02
768.4	2.70492695271969E-02
769.8	2.71796304732561E-02
771.2	2.73106824606657E-02
772.6	2.74424403905869E-02
774	2.75749042630196E-02
775.4	2.77080629020929E-02
776.8	2.78419405221939E-02
778.2	2.79765259474516E-02
779.6	2.81118229031563E-02
781	2.82478388398886E-02
782.4	2.83845700323582E-02
783.8	2.85220220685005E-02
785.2	2.86601949483156E-02
786.6	2.87991054356098E-02
788	2.89387293159962E-02
789.4	2.90790889412165E-02
790.8	2.92201805859804E-02
792.2	2.93620098382235E-02
793.6	2.95045748353004E-02
795	.029647883027792
796.4	2.97919325530529E-02
797.8	2.99367271363735E-02
799.2	3.00822798162699E-02
800.6	3.02285756915808E-02
802	.030375624075532
803.4	3.05234361439943E-02
804.8	3.06720044463873E-02
806.2	3.08213382959366E-02
807.6	3.09714358299971E-02
809	3.11223100870848E-02
810.4	3.12739424407482E-02
811.8	3.14263589680195E-02
813.2	3.15795466303825E-02
814.6	3.17335166037083E-02
816	.031888272613287
817.4	3.20438072085381E-02
818.8	3.22001352906227E-02
820.2	3.23572605848312E-02
821.6	.032515175640583
823	3.26738879084587E-02

824.4	3.28333973884583E-02
825.8	3.29937189817429E-02
827.2	3.31548452377319E-02
828.6	3.33167798817158E-02
830	3.34795229136944E-02
831.4	3.36430929601192E-02
832.8	3.38074900209904E-02
834.2	3.39726954698563E-02
835.6	3.41387428343296E-02
837	3.43056060373783E-02
838.4	3.44733074307442E-02
839.8	3.46418432891369E-02
841.2	3.48112210631371E-02
842.6	3.49814407527447E-02
844	.03515250608325
845.4	3.53244245052338E-02
846.8	3.54971960186958E-02
848.2	3.56708280742168E-02
849.6	3.58453169465065E-02
851	3.60206738114357E-02
852.4	3.61968912184238E-02
853.8	3.63739877939224E-02
855.2	3.65519598126411E-02
856.6	3.67308184504509E-02
858	3.69105413556099E-02
859.4	3.70911583304405E-02
860.8	3.72726619243622E-02
862.2	3.74550558626652E-02
863.6	3.76383624970913E-02
865	3.78225594758987E-02
866.4	3.80076617002487E-02
867.8	3.81936766207218E-02
869.2	3.83805967867374E-02
870.6	3.85684370994568E-02
872	3.87571975588799E-02
873.4	3.89468893408775E-02
874.8	.039137490093708
876.2	3.93290482461452E-02
877.6	3.95215265452862E-02
879	3.97149622440338E-02
880.4	3.99093255400658E-02
881.8	4.01046462357044E-02
883.2	4.03009206056595E-02
884.6	4.04981449246407E-02
886	.04069634526968
887.4	4.08954918384552E-02
888.8	4.10956181585789E-02
890.2	.041296724230051
891.6	4.14988026022911E-02
893	4.17018681764603E-02
894.4	4.19059172272682E-02
895.8	4.21109534800053E-02
897.2	4.23170067369938E-02
898.6	4.25240397453308E-02
900	4.27320934832096E-02
901.4	4.29411567747593E-02
902.8	4.31512258946896E-02
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926.6	4.68824133276939E-02
928	4.71115969121456E-02
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1089	8.26024934649467E-02
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1353.6	.228815317153931
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1378.8	.257327675819397
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1383	.262580662965775
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1391.4	.273568838834763
1392.8	.275465548038483
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1395.6	.279317200183868
1397	.281272709369659
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1404	.291356086730957
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1406.8	.295537084341049
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1420.8	.317799240350723
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1423.6	.322537809610367
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1467	.409929096698761
1468.4	.413214385509491
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1495	.481171369552612

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1520.2	.553975462913513
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1527.2	.575272262096405
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1530	.583887755870819
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1544	.6275914311409
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1584.6	.756282508373261
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1591.6	.778273701667786
1593	.782655596733093
1594.4	.787031292915344
1595.8	.791400849819183
1597.2	.795764446258545
1598.6	.800121068954468
1600	.804471969604492

#### KCl (Potassium chloride)

Wavelength $\lambda$ (nm)	Refractive index $n$ (-)
206.63	1.69512
209.59	1.67736
212.64	1.66432
215.78	1.6547
219.01	1.64718
222.33	1.63921
225.77	1.63119
229.3	1.62362
232.96	1.61646
236.73	1.60969
240.62	1.60326
244.64	1.59714
248.8	1.59132
253.11	1.58576
257.56	1.58044
262.18	1.57539
266.96	1.57057
271.93	1.56597
277.08	1.56155
282.43	1.55734
287.99	1.5533
293.77	1.54942
299.79	1.54569
306.06	1.54215
312.6	1.53874
319.42	1.53546
326.55	1.5323
334.01	1.52927
341.81	1.52639
349.99	1.52359
358.57	1.52072
367.58	1.51843
377.05	1.51586
387.03	1.51349
397.54	1.51121
408.65	1.50903
420.39	1.50694
432.83	1.50493
446.03	1.50294
460.05	1.50115
474.99	1.4998
490.93	1.49749

507.97	1.49605
526.25	1.4945
545.88	1.49301
567.04	1.49159
589.9	1.49024
614.69	1.48894
641.65	1.48772
671.08	1.48655
703.35	1.48544
738.87	1.4844
778.17	1.4834
821.89	1.48246
870.81	1.48158
925.93	1.48073
988.49	1.47996
1060.12	1.47922
1142.94	1.47852
1239.8	1.4779

Wavelength $\lambda$ (nm)	Extinction coefficient $k$ (-)
206.63	0
209.59	0
212.64	0
215.78	0
219.01	0
222.33	0
225.77	0
229.30	0
232.96	0
236.73	0
240.62	0
244.64	0
248.80	0
253.11	0
257.56	0
262.18	0
266.96	0
271.93	0
277.08	0
282.43	0
287.99	0
293.77	0
299.79	0
306.06	0
312.60	0
319.42	0
326.55	0
334.01	0
341.81	0
349.99	0
358.57	0
367.58	0
377.05	0
387.03	0
397.54	0
408.65	0
420.39	0
432.83	0
446.03	0
460.05	0

474.99	0
490.93	0
507.97	0
526.25	0
545.88	0
567.04	0
589.90	0
614.69	0
641.65	0
671.08	0
703.35	0
738.87	0
778.17	0
821.89	0
870.81	0
925.93	0
988.49	0
1060.12	0
1142.94	0
1239.80	0

### **MgF2 (Magnesium fluoride)**

Wavelength $\lambda$ (nm)	Refractive index $n$ (-)
250	1.4117
275	1.4044
300	1.3996
325	1.3961
350	1.3935
375	1.3915
400	1.3899
425	1.3886
450	1.3875
475	1.3865
500	1.3857
525	1.385
550	1.3844
575	1.3839
600	1.3834
625	1.383
650	1.3826
675	1.3823
700	1.3819
725	1.3816
750	1.3814
775	1.3811
800	1.3809
825	1.3807
850	1.3805
875	1.3803
900	1.3802

Wavelength $\lambda$ (nm)	Extinction coefficient $k$ (-)
250.00	0
275.00	0
300.00	0
325.00	0
350.00	0
375.00	0
400.00	0

425.00	0
450.00	0
475.00	0
500.00	0
525.00	0
550.00	0
575.00	0
600.00	0
625.00	0
650.00	0
675.00	0
700.00	0
725.00	0
750.00	0
775.00	0
800.00	0
825.00	0
850.00	0
875.00	0
900.00	0

#### **MgO (Magnesium oxide)**

Wavelength $\lambda$ (nm)	Refractive index $n$ (-)
382.1	1.769
404.7	1.761
500	1.745
589.3	1.737
706.5	1.731
767.9	1.729
1000	1.723
1128.7	1.721
1367.3	1.717
1550	1.715
1709.2	1.713

Wavelength $\lambda$ (nm)	Extinction coefficient $k$ (-)
382.1	0
404.7	0
500	0
589.3	0
706.5	0
767.9	0
1000	0
1128.7	0
1367.3	0
1550	0
1709.2	0

#### **Mo (Molybdenum)**

Wavelength $\lambda$ (nm)	Refractive index $n$ (-)
206.63	.85
210.14	.873
213.76	.895
217.51	.924
221.39	.959
225.42	1
229.59	1.06
233.92	1.13
238.42	1.22

243.1	1.33
247.96	1.46
253.02	1.61
258.29	1.75
263.79	1.9
269.52	2.06
275.51	2.21
281.77	2.39
288.33	2.59
295.19	2.77
302.39	2.91
309.95	3.01
317.9	3.04
326.26	3.04
335.08	3.04
344.39	3.05
354.23	3.06
364.65	3.06
375.7	3.06
387.44	3.05
399.94	3.03
413.27	3.04
427.52	3.05
442.79	3.08
459.19	3.13
476.85	3.22
495.92	3.36
516.58	3.59
539.04	3.79
563.55	3.76
590.38	3.68
619.9	3.68
652.53	3.74
688.78	3.81
729.29	3.84
774.87	3.77
826.53	3.53
885.57	3.15
953.69	2.77
1033.17	2.44
1127.09	2.16
1239.8	1.94

Wavelength $\lambda$ (nm)	Extinction coefficient $k$ (-)
206.63	2.64
210.14	2.72
213.76	2.8
217.51	2.89
221.39	2.99
225.42	3.09
229.59	3.2
233.92	3.31
238.42	3.42
243.10	3.53
247.96	3.62
253.02	3.7
258.29	3.76
263.79	3.81
269.52	3.84
275.51	3.87



281.77	3.88
288.33	3.86
295.19	3.77
302.39	3.67
309.95	3.51
317.90	3.4
326.26	3.31
335.08	3.27
344.39	3.24
354.23	3.21
364.65	3.19
375.70	3.18
387.44	3.18
399.94	3.22
413.27	3.27
427.52	3.33
442.79	3.42
459.19	3.51
476.85	3.61
495.92	3.73
516.58	3.78
539.04	3.61
563.55	3.41
590.38	3.45
619.90	3.52
652.53	3.58
688.78	3.58
729.29	3.51
774.87	3.41
826.53	3.3
885.57	3.4
953.69	3.74
1033.17	4.22
1127.09	4.85
1239.80	5.58

#### Ni (Nickel)

Wavelength $\lambda$ (nm)	Refractive index $n$ (-)
206.63	1.01
210.14	1.02
213.76	1.04
217.51	1.06
221.39	1.09
225.42	1.12
229.59	1.16
233.92	1.21
238.42	1.27
243.1	1.33
247.96	1.4
253.02	1.47
258.29	1.53
263.79	1.59
269.52	1.63
275.51	1.67
281.77	1.71
288.33	1.73
295.19	1.74
302.39	1.74
309.95	1.73
317.9	1.72

326.26	1.69
335.08	1.66
344.39	1.64
354.23	1.63
364.65	1.62
375.7	1.61
387.44	1.61
399.94	1.61
413.27	1.61
427.52	1.62
442.79	1.63
459.19	1.64
476.85	1.65
495.92	1.67
516.58	1.71
539.04	1.75
563.55	1.8
590.38	1.85
619.9	1.92
652.53	2.02
688.78	2.14
729.29	2.28
774.87	2.43
826.53	2.53
885.57	2.65
953.69	2.74
1033.17	2.85
1127.09	2.97
1239.8	3.06

Wavelength $\lambda$ (nm)	Extinction coefficient $k$ (-)
206.63	1.63
210.14	1.67
213.76	1.73
217.51	1.78
221.39	1.83
225.42	1.88
229.59	1.94
233.92	1.99
238.42	2.04
243.10	2.07
247.96	2.1
253.02	2.11
258.29	2.11
263.79	2.1
269.52	2.09
275.51	2.07
281.77	2.06
288.33	2.03
295.19	2.01
302.39	2
309.95	1.98
317.90	1.98
326.26	1.99
335.08	2.02
344.39	2.07
354.23	2.11
364.65	2.17
375.70	2.23
387.44	2.3

399.94	2.36
413.27	2.44
427.52	2.52
442.79	2.61
459.19	2.71
476.85	2.81
495.92	2.93
516.58	3.06
539.04	3.19
563.55	3.33
590.38	3.48
619.90	3.65
652.53	3.82
688.78	4.01
729.29	4.18
774.87	4.31
826.53	4.47
885.57	4.63
953.69	4.85
1033.17	5.1
1127.09	5.38
1239.80	5.74

#### **NiP (Nickel phosphide)**

Wavelength $\lambda$ (nm)	Refractive index $n$ (-)
190	1.600539
191	1.605479
192	1.611022
193	1.617136
194	1.623775
195	1.630875
196	1.638357
197	1.64613
198	1.65409
199	1.662129
200	1.670133
201	1.677993
202	1.685603
203	1.69287
204	1.699713
205	1.706064
206	1.711874
207	1.717109
208	1.721752
209	1.725797
210	1.729253
211	1.732138
212	1.734479
213	1.736308
214	1.73766
215	1.738575
216	1.739092
217	1.73925
218	1.739088
219	1.738642
220	1.737947
221	1.737034
222	1.735935
223	1.734677
224	1.733283

225	1.731776
226	1.730177
227	1.728504
228	1.726773
229	1.724997
230	1.72319
231	1.721363
232	1.719525
233	1.717687
234	1.715854
235	1.714035
236	1.712235
237	1.710459
238	1.708712
239	1.706998
240	1.70532
241	1.703682
242	1.702087
243	1.700537
244	1.699033
245	1.697579
246	1.696176
247	1.694824
248	1.693526
249	1.692283
250	1.691096
251	1.689966
252	1.688894
253	1.68788
254	1.686925
255	1.686031
256	1.685198
257	1.684426
258	1.683716
259	1.683068
260	1.682483
261	1.681962
262	1.681506
263	1.681113
264	1.680786
265	1.680524
266	1.680328
267	1.680198
268	1.680134
269	1.680138
270	1.680209
271	1.680348
272	1.680555
273	1.68083
274	1.681174
275	1.681587
276	1.68207
277	1.682622
278	1.683243
279	1.683935
280	1.684696
281	1.685528
282	1.686431
283	1.687404
284	1.688448

285	1.689562
286	1.690747
287	1.692003
288	1.693329
289	1.694725
290	1.696192
291	1.697729
292	1.699335
293	1.701011
294	1.702756
295	1.70457
296	1.706452
297	1.708401
298	1.710418
299	1.712502
300	1.714651
301	1.716865
302	1.719144
303	1.721486
304	1.723891
305	1.726357
306	1.728884
307	1.73147
308	1.734114
309	1.736816
310	1.739573
311	1.742385
312	1.745249
313	1.748165
314	1.751132
315	1.754146
316	1.757208
317	1.760315
318	1.763465
319	1.766657
320	1.769889
321	1.773158
322	1.776464
323	1.779804
324	1.783177
325	1.78658
326	1.790011
327	1.793468
328	1.796949
329	1.800452
330	1.803976
331	1.807517
332	1.811074
333	1.814645
334	1.818227
335	1.821818
336	1.825417
337	1.829022
338	1.832629
339	1.836237
340	1.839845
341	1.84345
342	1.84705
343	1.850643
344	1.854228

345	1.857802
346	1.861363
347	1.864911
348	1.868443
349	1.871957
350	1.875453
351	1.878927
352	1.88238
353	1.885808
354	1.889212
355	1.89259
356	1.89594
357	1.899261
358	1.902552
359	1.905812
360	1.90904
361	1.912235
362	1.915397
363	1.918523
364	1.921614
365	1.92467
366	1.927688
367	1.930669
368	1.933612
369	1.936517
370	1.939384
371	1.942211
372	1.944999
373	1.947749
374	1.950458
375	1.953128
376	1.955758
377	1.958349
378	1.960899
379	1.963411
380	1.965883
381	1.968316
382	1.97071
383	1.973066
384	1.975383
385	1.977662
386	1.979904
387	1.982108
388	1.984276
389	1.986407
390	1.988503
391	1.990564
392	1.992589
393	1.994581
394	1.996539
395	1.998465
396	2.000358
397	2.002219
398	2.00405
399	2.00585
400	2.00762
401	2.009362
402	2.011075
403	2.012761
404	2.01442

405	2.016053
406	2.017661
407	2.019244
408	2.020803
409	2.022339
410	2.023853
411	2.025344
412	2.026815
413	2.028265
414	2.029696
415	2.031108
416	2.032502
417	2.033879
418	2.035238
419	2.036582
420	2.03791
421	2.039224
422	2.040523
423	2.041809
424	2.043083
425	2.044344
426	2.045594
427	2.046833
428	2.048062
429	2.049281
430	2.050491
431	2.051693
432	2.052887
433	2.054075
434	2.055254
435	2.056428
436	2.057597
437	2.05876
438	2.059918
439	2.061073
440	2.062224
441	2.063372
442	2.064517
443	2.06566
444	2.066801
445	2.06794
446	2.06908
447	2.070218
448	2.071357
449	2.072496
450	2.073635
451	2.074776
452	2.075918
453	2.077062
454	2.078208
455	2.079357
456	2.080508
457	2.081663
458	2.082821
459	2.083983
460	2.085149
461	2.086319
462	2.087494
463	2.088674
464	2.089859

465	2.091049
466	2.092246
467	2.093447
468	2.094655
469	2.09587
470	2.097091
471	2.098319
472	2.099553
473	2.100795
474	2.102044
475	2.1033
476	2.104565
477	2.105836
478	2.107117
479	2.108405
480	2.109701
481	2.111006
482	2.112319
483	2.113641
484	2.114972
485	2.116311
486	2.11766
487	2.119018
488	2.120385
489	2.121761
490	2.123147
491	2.124542
492	2.125947
493	2.127362
494	2.128785
495	2.13022
496	2.131663
497	2.133117
498	2.134581
499	2.136054
500	2.137538
501	2.139032
502	2.140536
503	2.14205
504	2.143574
505	2.145109
506	2.146654
507	2.148209
508	2.149775
509	2.15135
510	2.152936
511	2.154533
512	2.15614
513	2.157757
514	2.159385
515	2.161023
516	2.162671
517	2.16433
518	2.165999
519	2.167679
520	2.169369
521	2.171069
522	2.172779
523	2.1745
524	2.176231



525	2.177972
526	2.179724
527	2.181485
528	2.183257
529	2.18504
530	2.186831
531	2.188634
532	2.190447
533	2.192269
534	2.194101
535	2.195944
536	2.197796
537	2.199659
538	2.201531
539	2.203413
540	2.205304
541	2.207206
542	2.209117
543	2.211038
544	2.212969
545	2.214909
546	2.216858
547	2.218818
548	2.220787
549	2.222764
550	2.224751
551	2.226748
552	2.228754
553	2.230769
554	2.232793
555	2.234826
556	2.236869
557	2.23892
558	2.240981
559	2.24305
560	2.245128
561	2.247215
562	2.249311
563	2.251416
564	2.253529
565	2.255651
566	2.257781
567	2.25992
568	2.262068
569	2.264224
570	2.266388
571	2.268561
572	2.270742
573	2.272931
574	2.275129
575	2.277335
576	2.279549
577	2.281771
578	2.284001
579	2.286239
580	2.288486
581	2.29074
582	2.293001
583	2.295271
584	2.297549

585	2.299835
586	2.302129
587	2.30443
588	2.306739
589	2.309055
590	2.311379
591	2.313711
592	2.316051
593	2.318398
594	2.320752
595	2.323114
596	2.325484
597	2.327862
598	2.330246
599	2.332638
600	2.335038
601	2.337445
602	2.339859
603	2.342281
604	2.344711
605	2.347147
606	2.349591
607	2.352043
608	2.354502
609	2.356968
610	2.359441
611	2.361922
612	2.36441
613	2.366906
614	2.369409
615	2.37192
616	2.374438
617	2.376963
618	2.379496
619	2.382036
620	2.384584
621	2.387139
622	2.389702
623	2.392272
624	2.39485
625	2.397436
626	2.400029
627	2.40263
628	2.405238
629	2.407854
630	2.410478
631	2.41311
632	2.41575
633	2.418397
634	2.421052
635	2.423716
636	2.426387
637	2.429067
638	2.431755
639	2.43445
640	2.437155
641	2.439867
642	2.442589
643	2.445318
644	2.448056

645	2.450802
646	2.453558
647	2.456322
648	2.459095
649	2.461876
650	2.464667
651	2.467467
652	2.470276
653	2.473094
654	2.475922
655	2.478759
656	2.481606
657	2.484462
658	2.487328
659	2.490204
660	2.493089
661	2.495986
662	2.498892
663	2.501808
664	2.504735
665	2.507672
666	2.51062
667	2.513579
668	2.516548
669	2.519529
670	2.522521
671	2.525524
672	2.528538
673	2.531564
674	2.534602
675	2.537652
676	2.540713
677	2.543787
678	2.546873
679	2.549971
680	2.553082
681	2.556206
682	2.559343
683	2.562493
684	2.565655
685	2.568832
686	2.572022
687	2.575225
688	2.578443
689	2.581674
690	2.58492
691	2.588181
692	2.591455
693	2.594745
694	2.59805
695	2.60137
696	2.604705
697	2.608056
698	2.611422
699	2.614805
700	2.618203
701	2.621618
702	2.62505
703	2.628498
704	2.631963

705	2.635445
706	2.638945
707	2.642462
708	2.645998
709	2.649551
710	2.653121
711	2.656711
712	2.66032
713	2.663947
714	2.667594
715	2.671259
716	2.674945
717	2.67865
718	2.682375
719	2.686121
720	2.689886
721	2.693673
722	2.697481
723	2.701309
724	2.705159
725	2.709032
726	2.712925
727	2.716841
728	2.72078
729	2.724741
730	2.728725
731	2.732732
732	2.736763
733	2.740817
734	2.744895
735	2.748998
736	2.753124
737	2.757276
738	2.761452
739	2.765654
740	2.76988
741	2.774133
742	2.778412
743	2.782717
744	2.787048
745	2.791406
746	2.795791
747	2.800203
748	2.804643
749	2.809111
750	2.813606
751	2.81813
752	2.822682
753	2.827264
754	2.831874
755	2.836514
756	2.841183
757	2.845882
758	2.850611
759	2.855371
760	2.860161
761	2.864982
762	2.869835
763	2.874718
764	2.879634

765	2.884581
766	2.889561
767	2.894573
768	2.899618
769	2.904696
770	2.909806
771	2.914951
772	2.920129
773	2.925341
774	2.930588
775	2.935869
776	2.941184
777	2.946534
778	2.95192
779	2.95734
780	2.962797
781	2.96829
782	2.973819
783	2.979383
784	2.984986
785	2.990624
786	2.9963
787	3.002012
788	3.007763
789	3.013551
790	3.019377
791	3.025241
792	3.031144
793	3.037085
794	3.043065
795	3.049083
796	3.055142
797	3.061239
798	3.067377
799	3.073553
800	3.07977
801	3.086027
802	3.092324
803	3.098662
804	3.105041
805	3.11146
806	3.11792
807	3.124422
808	3.130965
809	3.137549
810	3.144175
811	3.150842
812	3.157552
813	3.164304
814	3.171098
815	3.177933
816	3.184812
817	3.191733
818	3.198696
819	3.205703
820	3.212752
821	3.219845
822	3.22698
823	3.234159
824	3.24138

825	3.248646
826	3.255954
827	3.263306
828	3.270701
829	3.27814
830	3.285622
831	3.293149
832	3.300719
833	3.308332
834	3.31599
835	3.323691
836	3.331435
837	3.339224
838	3.347056
839	3.354932
840	3.362852
841	3.370816
842	3.378823
843	3.386874
844	3.394969
845	3.403106
846	3.411288
847	3.419513
848	3.427782
849	3.436094
850	3.444448
851	3.452847
852	3.461288
853	3.469772
854	3.478299
855	3.486868
856	3.495481
857	3.504135
858	3.512832
859	3.521571
860	3.530352
861	3.539175
862	3.54804
863	3.556946
864	3.565893
865	3.574881
866	3.58391
867	3.592981
868	3.602091
869	3.611242
870	3.620432
871	3.629662
872	3.638932
873	3.648241
874	3.657589
875	3.666976
876	3.676401
877	3.685864
878	3.695365
879	3.704904
880	3.714479
881	3.724092
882	3.733742
883	3.743426
884	3.753148

885	3.762905
886	3.772696
887	3.782523
888	3.792384
889	3.802279
890	3.812208
891	3.82217
892	3.832165
893	3.842191
894	3.852251
895	3.862342
896	3.872463
897	3.882616
898	3.892798
899	3.903011
900	3.913252

Wavelength $\lambda$ (nm)	Extinction coefficient $k$ (-)
190	1.51E+00
191	1.52E+00
192	1.53E+00
193	1.54E+00
194	1.55E+00
195	1.55E+00
196	1.56E+00
197	1.57E+00
198	1.57E+00
199	1.58E+00
200	1.58E+00
201	1.58E+00
202	1.58E+00
203	1.59E+00
204	1.59E+00
205	1.59E+00
206	1.59E+00
207	1.59E+00
208	1.59E+00
209	1.58E+00
210	1.58E+00
211	1.58E+00
212	1.58E+00
213	1.58E+00
214	1.58E+00
215	1.58E+00
216	1.58E+00
217	1.57E+00
218	1.57E+00
219	1.57E+00
220	1.57E+00
221	1.57E+00
222	1.57E+00
223	1.58E+00
224	1.58E+00
225	1.58E+00
226	1.58E+00
227	1.58E+00
228	1.58E+00
229	1.58E+00
230	1.59E+00
231	1.59E+00

232	1.59E+00
233	1.59E+00
234	1.60E+00
235	1.60E+00
236	1.60E+00
237	1.61E+00
238	1.61E+00
239	1.61E+00
240	1.62E+00
241	1.62E+00
242	1.62E+00
243	1.63E+00
244	1.63E+00
245	1.64E+00
246	1.64E+00
247	1.64E+00
248	1.65E+00
249	1.65E+00
250	1.66E+00
251	1.66E+00
252	1.67E+00
253	1.67E+00
254	1.68E+00
255	1.68E+00
256	1.69E+00
257	1.69E+00
258	1.70E+00
259	1.70E+00
260	1.71E+00
261	1.71E+00
262	1.72E+00
263	1.72E+00
264	1.73E+00
265	1.73E+00
266	1.74E+00
267	1.75E+00
268	1.75E+00
269	1.76E+00
270	1.76E+00
271	1.77E+00
272	1.77E+00
273	1.78E+00
274	1.78E+00
275	1.79E+00
276	1.80E+00
277	1.80E+00
278	1.81E+00
279	1.81E+00
280	1.82E+00
281	1.82E+00
282	1.83E+00
283	1.84E+00
284	1.84E+00
285	1.85E+00
286	1.85E+00
287	1.86E+00
288	1.86E+00
289	1.87E+00
290	1.88E+00
291	1.88E+00



292	1.89E+00
293	1.89E+00
294	1.90E+00
295	1.90E+00
296	1.91E+00
297	1.92E+00
298	1.92E+00
299	1.93E+00
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301	1.94E+00
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311	1.99E+00
312	2.00E+00
313	2.00E+00
314	2.01E+00
315	2.01E+00
316	2.02E+00
317	2.02E+00
318	2.03E+00
319	2.03E+00
320	2.04E+00
321	2.04E+00
322	2.05E+00
323	2.05E+00
324	2.05E+00
325	2.06E+00
326	2.06E+00
327	2.07E+00
328	2.07E+00
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330	2.08E+00
331	2.08E+00
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345	2.13E+00
346	2.14E+00
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359	2.17E+00
360	2.17E+00
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364	2.18E+00
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374	2.20E+00
375	2.21E+00
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380	2.21E+00
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410	2.27E+00
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414	2.28E+00
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573	2.77E+00
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575	2.77E+00
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579	2.79E+00
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581	2.80E+00
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586	2.81E+00
587	2.82E+00
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590	2.83E+00
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626	2.96E+00
627	2.96E+00
628	2.97E+00
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717	3.33E+00
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732	3.39E+00
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736	3.41E+00
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779	3.61E+00
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781	3.62E+00
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783	3.63E+00
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797	3.70E+00
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807	3.74E+00
808	3.75E+00
809	3.75E+00
810	3.76E+00
811	3.76E+00
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813	3.77E+00
814	3.78E+00
815	3.78E+00
816	3.78E+00
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818	3.79E+00
819	3.80E+00
820	3.80E+00
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822	3.81E+00
823	3.82E+00
824	3.82E+00
825	3.82E+00
826	3.83E+00
827	3.83E+00
828	3.84E+00
829	3.84E+00
830	3.85E+00
831	3.85E+00

832	3.85E+00
833	3.86E+00
834	3.86E+00
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839	3.88E+00
840	3.89E+00
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842	3.90E+00
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845	3.91E+00
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847	3.92E+00
848	3.92E+00
849	3.92E+00
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853	3.94E+00
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855	3.94E+00
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857	3.95E+00
858	3.96E+00
859	3.96E+00
860	3.96E+00
861	3.97E+00
862	3.97E+00
863	3.97E+00
864	3.98E+00
865	3.98E+00
866	3.98E+00
867	3.99E+00
868	3.99E+00
869	3.99E+00
870	4.00E+00
871	4.00E+00
872	4.00E+00
873	4.00E+00
874	4.01E+00
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886	4.04E+00
887	4.04E+00
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889	4.05E+00
890	4.05E+00
891	4.05E+00

892	4.05E+00
893	4.05E+00
894	4.06E+00
895	4.06E+00
896	4.06E+00
897	4.06E+00
898	4.06E+00
899	4.06E+00
900	4.07E+00

# **PbS (Lead sulphide)**

Wavelength  $\lambda$  (nm)      Refractive index  $n$  (-)

199.97	1.13
204.92	1.2
210.13	1.22
215.61	1.22
221.38	1.24
227.47	1.3
233.9	1.37
240.71	1.43
247.93	1.5
255.59	1.53
263.74	1.54
272.43	1.54
281.71	1.54
291.64	1.6
302.3	1.69
313.77	1.77
326.15	1.97
339.54	2.33
354.07	2.78
369.91	3.17
387.23	3.46
406.25	3.79
427.24	4.12
450.51	4.25
476.47	4.33
505.6	4.35
538.52	4.32
576.03	4.29
619.16	4.29
669.26	4.47
728.19	4.6
798.5	4.6
883.84	4.5
989.6	4.44
1124.11	4.34
1300.94	4.28

Wavelength  $\lambda$  (nm)      Extinction coefficient  $k$  (-)

199.97	1.7
204.92	1.74
210.13	1.78
215.61	1.82
221.38	1.87
227.47	1.93
233.90	1.99
240.71	2.05
247.93	2.09

255.59	2.14
263.74	2.23
272.43	2.35
281.71	2.48
291.64	2.58
302.30	2.74
313.77	2.88
326.15	3.08
339.54	3.32
354.07	3.37
369.91	3.37
387.23	3.24
406.25	3.08
427.24	2.71
450.51	2.33
476.47	2.08
505.60	1.83
538.52	1.62
576.03	1.53
619.16	1.48
669.26	1.36
728.19	1.12
798.50	0.92
883.84	0.83
989.60	0.6
1124.11	0.49
1300.94	0.4

#### **PbSe (Lead selenide)**

Wavelength  $\lambda$  (nm)      Refractive index  $n$  (-)

206.63	.64
216.11	.61
226.5	.58
237.94	.55
250.6	.54
264.68	.55
280.43	.57
298.18	.61
318.33	.65
341.39	.69
368.07	.83
399.26	1.11
436.23	1.55
480.74	2.14
535.37	2.81
604.01	3.51
692.83	4.24
812.28	4.63
981.51	4.64
1239.8	4.65

Wavelength  $\lambda$  (nm)      Extinction coefficient  $k$  (-)

206.63	0.86
216.11	0.92
226.50	1.01
237.94	1.12
250.60	1.2
264.68	1.24
280.43	1.38

298.18	1.69
318.33	2
341.39	2.26
368.07	2.61
399.26	3.04
436.23	3.27
480.74	3.25
535.37	3.12
604.01	2.94
692.83	2.77
812.28	2.67
981.51	1.64
1239.80	1.1

# **PET**

Wavelength $\lambda$ (nm)	Refractive index $n$ (-)
399.78	1.7004
400.76	1.6985
401.73	1.6966
402.71	1.6947
403.69	1.6929
404.66	1.6911
405.64	1.6893
406.61	1.6875
407.59	1.6857
408.56	1.684
409.53	1.6823
410.51	1.6806
411.48	1.6789
412.45	1.6773
413.43	1.6756
414.4	1.674
415.37	1.6724
416.34	1.6709
417.31	1.6693
418.28	1.6678
419.25	1.6663
420.22	1.6648
421.19	1.6633
422.16	1.6619
423.13	1.6605
424.1	1.659
425.07	1.6576
426.04	1.6562
427	1.6549
427.97	1.6535
428.94	1.6522
429.9	1.6509
430.87	1.6496
431.84	1.6483
432.8	1.647
433.77	1.6458
434.73	1.6446
435.7	1.6433
436.66	1.6421
437.62	1.6409
438.59	1.6397
439.55	1.6386
440.51	1.6374

441.47	1.6363
442.44	1.6352
443.4	1.6341
444.36	1.633
445.32	1.6319
446.28	1.6308
447.24	1.6297
448.2	1.6287
449.16	1.6277
450.12	1.6266
451.08	1.6256
452.04	1.6246
453	1.6236
453.95	1.6227
454.91	1.6217
455.87	1.6207
456.82	1.6198
457.78	1.6189
458.74	1.6179
459.69	1.617
460.65	1.6161
461.6	1.6152
462.56	1.6144
463.51	1.6135
464.47	1.6126
465.42	1.6118
466.37	1.6109
467.33	1.6101
468.28	1.6093
469.23	1.6085
470.18	1.6077
471.14	1.6069
472.09	1.6061
473.04	1.6053
473.99	1.6045
474.94	1.6038
475.89	1.603
476.84	1.6023
477.79	1.6015
478.74	1.6008
479.68	1.6001
480.63	1.5994
481.58	1.5987
482.53	1.598
483.47	1.5973
484.42	1.5966
485.37	1.5959
486.31	1.5953
487.26	1.5946
488.2	1.594
489.15	1.5933
490.09	1.5927
491.04	1.592
491.98	1.5914
492.93	1.5908
493.87	1.5902
494.81	1.5896
495.76	1.589
496.7	1.5884
497.64	1.5878

498.58	1.5872
499.52	1.5866
500.46	1.5861
501.4	1.5855
502.34	1.585
503.28	1.5844
504.22	1.5839
505.16	1.5833
506.1	1.5828
507.04	1.5823
507.98	1.5817
508.92	1.5812
509.85	1.5807
510.79	1.5802
511.73	1.5797
512.66	1.5792
513.6	1.5787
514.53	1.5782
515.47	1.5777
516.41	1.5773
517.34	1.5768
518.27	1.5763
519.21	1.5759
520.14	1.5754
521.07	1.575
522.01	1.5745
522.94	1.5741
523.87	1.5736
524.8	1.5732
525.74	1.5728
526.67	1.5723
527.6	1.5719
528.53	1.5715
529.46	1.5711
530.39	1.5707
531.32	1.5703
532.25	1.5699
533.18	1.5695
534.1	1.5691
535.03	1.5687
535.96	1.5683
536.89	1.5679
537.81	1.5675
538.74	1.5672
539.67	1.5668
540.59	1.5664
541.52	1.5661
542.44	1.5657
543.37	1.5654
544.29	1.565
545.22	1.5647
546.14	1.5643
547.07	1.564
547.99	1.5636
548.91	1.5633
549.83	1.563
550.76	1.5626
551.68	1.5623
552.6	1.562
553.52	1.5617

554.44	1.5613
555.36	1.561
556.28	1.5607
557.2	1.5604
558.12	1.5601
559.04	1.5598
559.96	1.5595
560.88	1.5592
561.8	1.5589
562.71	1.5586
563.63	1.5583
564.55	1.558
565.46	1.5578
566.38	1.5575
567.3	1.5572
568.21	1.5569
569.13	1.5566
570.04	1.5564
570.96	1.5561
571.87	1.5558
572.78	1.5556
573.7	1.5553
574.61	1.5551
575.52	1.5548
576.44	1.5545
577.35	1.5543
578.26	1.554
579.17	1.5538
580.08	1.5536
580.99	1.5533
581.9	1.5531
582.81	1.5528
583.72	1.5526
584.63	1.5524
585.54	1.5521
586.45	1.5519
587.36	1.5517
588.27	1.5515
589.18	1.5512
590.08	1.551
590.99	1.5508
591.9	1.5506
592.8	1.5504
593.71	1.5501
594.61	1.5499
595.52	1.5497
596.42	1.5495
597.33	1.5493
598.23	1.5491
599.14	1.5489
600.04	1.5487
600.94	1.5485
601.85	1.5483
602.75	1.5481
603.65	1.5479
604.55	1.5477
605.45	1.5475
606.35	1.5473
607.26	1.5472
608.16	1.547



609.06	1.5468
609.96	1.5466
610.85	1.5464
611.75	1.5463
612.65	1.5461
613.55	1.5459
614.45	1.5457
615.35	1.5456
616.24	1.5454
617.14	1.5452
618.04	1.545
618.93	1.5449
619.83	1.5447
620.72	1.5445
621.62	1.5444
622.51	1.5442
623.41	1.5441
624.3	1.5439
625.2	1.5437
626.09	1.5436
626.98	1.5434
627.88	1.5433
628.77	1.5431
629.66	1.543
630.55	1.5428
631.44	1.5427
632.33	1.5425
633.23	1.5424
634.12	1.5422
635.01	1.5421
635.9	1.542
636.78	1.5418
637.67	1.5417
638.56	1.5415
639.45	1.5414
640.34	1.5413
641.23	1.5411
642.11	1.541
643	1.5409
643.89	1.5407
644.77	1.5406
645.66	1.5405
646.54	1.5404
647.43	1.5402
648.31	1.5401
649.2	1.54
650.08	1.5399
650.97	1.5397
651.85	1.5396
652.73	1.5395
653.61	1.5394
654.5	1.5392
655.38	1.5391
656.26	1.539
657.14	1.5389
658.02	1.5388
658.9	1.5387
659.78	1.5386
660.66	1.5384
661.54	1.5383

662.42	1.5382
663.3	1.5381
664.18	1.538
665.06	1.5379
665.94	1.5378
666.81	1.5377
667.69	1.5376
668.57	1.5375
669.44	1.5374
670.32	1.5373
671.2	1.5372
672.07	1.5371
672.95	1.537
673.82	1.5369
674.7	1.5368
675.57	1.5367
676.44	1.5366
677.32	1.5365
678.19	1.5364
679.06	1.5363
679.94	1.5362
680.81	1.5361
681.68	1.536
682.55	1.5359
683.42	1.5358
684.29	1.5357
685.16	1.5356
686.03	1.5355
686.9	1.5355
687.77	1.5354
688.64	1.5353
689.51	1.5352
690.38	1.5351
691.24	1.535
692.11	1.5349
692.98	1.5349
693.85	1.5348
694.71	1.5347
695.58	1.5346
696.44	1.5345
697.31	1.5345
698.17	1.5344
699.04	1.5343
699.9	1.5342
700.77	1.5341
701.63	1.5341
702.49	1.534
703.36	1.5339
704.22	1.5338
705.08	1.5338
705.94	1.5337
706.81	1.5336
707.67	1.5335
708.53	1.5335
709.39	1.5334
710.25	1.5333
711.11	1.5332
711.97	1.5332
712.83	1.5331
713.69	1.533

714.54	1.533
715.4	1.5329
716.26	1.5328
717.12	1.5328
717.97	1.5327
718.83	1.5326
719.69	1.5326
720.54	1.5325
721.4	1.5324
722.26	1.5324
723.11	1.5323
723.96	1.5322
724.82	1.5322
725.67	1.5321
726.53	1.5321
727.38	1.532
728.23	1.5319
729.09	1.5319
729.94	1.5318
730.79	1.5318
731.64	1.5317
732.49	1.5316
733.34	1.5316
734.19	1.5315
735.04	1.5315
735.89	1.5314
736.74	1.5314
737.59	1.5313
738.44	1.5312
739.29	1.5312
740.14	1.5311
740.99	1.5311
741.83	1.531
742.68	1.531
743.53	1.5309
744.37	1.5309
745.22	1.5308
746.06	1.5308
746.91	1.5307
747.75	1.5307
748.6	1.5306
749.44	1.5306
750.29	1.5305
751.13	1.5305
751.97	1.5304
752.82	1.5304
753.66	1.5303
754.5	1.5303
755.34	1.5302
756.19	1.5302
757.03	1.5301
757.87	1.5301
758.71	1.53
759.55	1.53
760.39	1.5299
761.23	1.5299
762.07	1.5298
762.91	1.5298
763.74	1.5298
764.58	1.5297

765.42	1.5297
766.26	1.5296
767.09	1.5296
767.93	1.5295
768.77	1.5295
769.6	1.5295
770.44	1.5294
771.27	1.5294
772.11	1.5293
772.94	1.5293
773.78	1.5292
774.61	1.5292
775.44	1.5292
776.28	1.5291
777.11	1.5291
777.94	1.529
778.78	1.529
779.61	1.529
780.44	1.5289
781.27	1.5289
782.1	1.5289
782.93	1.5288
783.76	1.5288
784.59	1.5287
785.42	1.5287
786.25	1.5287
787.08	1.5286
787.91	1.5286
788.73	1.5286
789.56	1.5285
790.39	1.5285
791.22	1.5285
792.04	1.5284
792.87	1.5284
793.7	1.5283
794.52	1.5283
795.35	1.5283
796.17	1.5282
797	1.5282
797.82	1.5282
798.64	1.5281
799.47	1.5281
800.29	1.5281
801.11	1.5281
801.94	1.528
802.76	1.528
803.58	1.528
804.4	1.5279
805.22	1.5279
806.04	1.5279
806.86	1.5278
807.68	1.5278
808.5	1.5278
809.32	1.5277
810.14	1.5277
810.96	1.5277
811.78	1.5277
812.6	1.5276
813.41	1.5276
814.23	1.5276

815.05	1.5275
815.86	1.5275
816.68	1.5275
817.5	1.5275
818.31	1.5274
819.13	1.5274
819.94	1.5274
820.76	1.5273
821.57	1.5273
822.38	1.5273
823.2	1.5273
824.01	1.5272
824.82	1.5272
825.64	1.5272
826.45	1.5272
827.26	1.5271
828.07	1.5271
828.88	1.5271
829.69	1.5271
830.5	1.527
831.31	1.527
832.12	1.527
832.93	1.527
833.74	1.5269
834.55	1.5269
835.36	1.5269
836.17	1.5269
836.97	1.5268
837.78	1.5268
838.59	1.5268
839.39	1.5268
840.2	1.5267
841.01	1.5267
841.81	1.5267
842.62	1.5267
843.42	1.5267
844.23	1.5266
845.03	1.5266
845.83	1.5266
846.64	1.5266
847.44	1.5265
848.24	1.5265
849.05	1.5265
849.85	1.5265

### Polycarb

Wavelength $\lambda$ (nm)	Refractive index $n$ (-)
370	1.64002
380	1.63417
390	1.629
400	1.62441
410	1.62031
420	1.61663
430	1.61331
440	1.6103
450	1.60756
460	1.60506
470	1.60276
480	1.60065
490	1.5987

500	1.5969
510	1.59523
520	1.59367
530	1.59222
540	1.59086
550	1.58959
560	1.5884
570	1.58728
580	1.58623
590	1.58523
600	1.58429
610	1.58341
620	1.58257
630	1.58177
640	1.58101
650	1.5803
660	1.57961
670	1.57896
680	1.57834
690	1.57775
700	1.57719
710	1.57665
720	1.57613
730	1.57564
740	1.57516
750	1.57471
760	1.57427
770	1.57386
780	1.57346
790	1.57307
800	1.5727
810	1.57234
820	1.572
830	1.57167
840	1.57135
850	1.57104
860	1.57075
870	1.57046
880	1.57019
890	1.56992
900	1.56966
910	1.56941
920	1.56917
930	1.56894
940	1.56871
950	1.56849
960	1.56828
970	1.56808
980	1.56788
990	1.56769
1000	1.5675
1010	1.56732
1020	1.56714
1030	1.56697
1040	1.56681
1050	1.56664
1060	1.56649
1070	1.56634
1080	1.56619
1090	1.56604

1100	1.5659
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**Polyolef**

Wavelength $\lambda$ (nm)	Refractive index $n$ (-)
370	1.55405
380	1.54996
390	1.54664
400	1.5439
410	1.54163
420	1.53971
430	1.53806
440	1.53663
450	1.53538
460	1.53426
470	1.53325
480	1.53232
490	1.53147
500	1.53069
510	1.52995
520	1.52925
530	1.5286
540	1.52797
550	1.52738
560	1.52682
570	1.52628
580	1.52576
590	1.52526
600	1.52479
610	1.52433
620	1.5239
630	1.52348
640	1.52308
650	1.5227
660	1.52234
670	1.52199
680	1.52166
690	1.52135
700	1.52105
710	1.52077
720	1.5205
730	1.52025
740	1.52002
750	1.51979
760	1.51959
770	1.51939
780	1.51921
790	1.51905
800	1.51889
810	1.51875
820	1.51863
830	1.51851
840	1.51841
850	1.51832
860	1.51825
870	1.51818
880	1.51812
890	1.51808
900	1.51805
910	1.51803
920	1.51802

930	1.51802
940	1.51803
950	1.51805
960	1.51808
970	1.51812
980	1.51817
990	1.51823
1000	1.51829
1010	1.51837
1020	1.51846
1030	1.51855
1040	1.51865
1050	1.51876
1060	1.51888
1070	1.51901
1080	1.51915
1090	1.51929
1100	1.51944

### Polystyrene

Wavelength $\lambda$ (nm)	Refractive index $n$ (-)
370	1.64046
380	1.63553
390	1.63109
400	1.62708
410	1.62344
420	1.62012
430	1.6171
440	1.61432
450	1.61177
460	1.60942
470	1.60725
480	1.60524
490	1.60337
500	1.60164
510	1.60002
520	1.59851
530	1.5971
540	1.59577
550	1.59453
560	1.59336
570	1.59226
580	1.59123
590	1.59025
600	1.58932
610	1.58845
620	1.58762
630	1.58683
640	1.58609
650	1.58538
660	1.5847
670	1.58406
680	1.58345
690	1.58286
700	1.5823
710	1.58177
720	1.58126
730	1.58077
740	1.58031
750	1.57986



760	1.57943
770	1.57902
780	1.57863
790	1.57825
800	1.57788
810	1.57753
820	1.5772
830	1.57687
840	1.57656
850	1.57626
860	1.57597
870	1.57569
880	1.57542
890	1.57516
900	1.57491
910	1.57466
920	1.57443
930	1.5742
940	1.57398
950	1.57377
960	1.57356
970	1.57336
980	1.57317
990	1.57298
1000	1.5728
1010	1.57262
1020	1.57245
1030	1.57228
1040	1.57212
1050	1.57197
1060	1.57182
1070	1.57167
1080	1.57152
1090	1.57139
1100	1.57125

#### **Pt (Platinum)**

Wavelength $\lambda$ (nm)	Refractive index $n$ (-)
206.63	1.38
210.72	1.37
214.97	1.36
219.39	1.36
224	1.36
228.8	1.36
233.82	1.36
239.06	1.36
244.55	1.36
250.29	1.36
256.3	1.38
262.62	1.38
269.25	1.39
276.22	1.41
283.57	1.43
291.32	1.44
299.5	1.46
308.16	1.49
317.33	1.51
327.06	1.53
337.41	1.57
348.44	1.59

360.21	1.61
372.81	1.64
386.31	1.68
400.84	1.72
416.5	1.76
433.43	1.81
451.79	1.85
471.78	1.9
493.62	1.95
517.59	2.03
543.99	2.11
573.24	2.19
605.81	2.27
642.31	2.35
683.48	2.49
730.29	2.63
783.99	2.79
846.21	2.98
919.16	3.19
1005.88	3.46
1110.65	3.81
1239.8	4.25

Wavelength $\lambda$ (nm)	Extinction coefficient $k$ (-)
206.63	1.4
210.72	1.44
214.97	1.48
219.39	1.52
224	1.56
228.8	1.6
233.82	1.64
239.06	1.68
244.55	1.73
250.29	1.78
256.3	1.83
262.62	1.89
269.25	1.95
276.22	2
283.57	2.05
291.32	2.11
299.5	2.17
308.16	2.24
317.33	2.32
327.06	2.37
337.41	2.43
348.44	2.51
360.21	2.59
372.81	2.67
386.31	2.75
400.84	2.85
416.5	2.94
433.43	3.05
451.79	3.16
471.78	3.27
493.62	3.41
517.59	3.55
543.99	3.69
573.24	3.82
605.81	4
642.31	4.2

683.48	4.41
730.29	4.63
783.99	4.88
846.21	5.15
919.16	5.46
1005.88	5.82
1110.65	6.19
1239.8	6.62

# PZT

Wavelength  $\lambda$  (nm)      Refractive index  $n$  (-)

593.14	2.3994
600.89	2.3989
610.54	2.3983
620.16	2.3978
630.69	2.3974
640.23	2.3971
650.68	2.3969
660.14	2.3969
670.5	2.3969
680.82	2.3972
690.16	2.3976
700.39	2.3981
710.58	2.3989
720.72	2.3998
730.82	2.401
740.87	2.4023
750.88	2.4039
760.85	2.4056
770.76	2.4075
780.64	2.4095
790.47	2.4118
800.25	2.4142
810.88	2.4169
820.57	2.4195
830.21	2.4223
840.68	2.4253
850.24	2.4282
860.61	2.4313
870.07	2.4343
880.33	2.4374
890.55	2.4406
900.71	2.4437
910.82	2.4467
920.03	2.4494
930.04	2.4523
940.82	2.4553
950.71	2.458
960.55	2.4606
970.34	2.463
980.08	2.4653
990.56	2.4677
1000.19	2.4698
1010.55	2.4719
1020.06	2.4737
1030.31	2.4756
1040.49	2.4773

Wavelength  $\lambda$  (nm)      Extinction coefficient  $k$  (-)

593.14	0.0023
600.89	0.0023
610.54	0.0023
620.16	0.0024
630.69	0.0024
640.23	0.0024
650.68	0.0025
660.14	0.0025
670.5	0.0025
680.82	0.0026
690.16	0.0026
700.39	0.0026
710.58	0.0027
720.72	0.0027
730.82	0.0027
740.87	0.0027
750.88	0.0028
760.85	0.0028
770.76	0.0028
780.64	0.0029
790.47	0.0029
800.25	0.0029
810.88	0.0030
820.57	0.0030
830.21	0.0030
840.68	0.0031
850.24	0.0031
860.61	0.0031
870.07	0.0031
880.33	0.0032
890.55	0.0032
900.71	0.0032
910.82	0.0032
920.03	0.0033
930.04	0.0033
940.82	0.0033
950.71	0.0034
960.55	0.0034
970.34	0.0034
980.08	0.0034
990.56	0.0035
1000.19	0.0035
1010.55	0.0035
1020.06	0.0035
1030.31	0.0036
1040.49	0.0036

### Quartz

Wavelength $\lambda$ (nm)	Refractive index $n$ (-)
200	1.655
210	1.645
220	1.635
230	1.625
240	1.615
250	1.605
270	1.595
310	1.585
330	1.575
380	1.565
490	1.555

770	1.545
1030	1.535
2050	1.525

# **Rh (Rhenium)**

Wavelength $\lambda$ (nm)	Refractive index $n$ (-)
206.63	.76
210.36	.78
214.23	.79
218.24	.8
222.41	.8
226.73	.8
231.23	.8
235.91	.79
240.79	.79
245.87	.79
251.17	.79
256.7	.79
262.48	.79
268.53	.78
274.86	.79
281.5	.8
288.47	.83
295.79	.84
303.49	.84
311.61	.86
320.17	.89
329.21	.92
338.78	.97
348.93	1.01
359.7	1.07
371.15	1.16
383.36	1.26
396.4	1.38
410.36	1.51
425.33	1.62
441.44	1.72
458.82	1.8
477.63	1.85
498.04	1.88
520.27	1.91
544.59	1.95
571.28	2.01
600.73	2.07
633.38	2.15
669.78	2.25
710.62	2.36
756.76	2.53
809.31	2.72
869.71	2.95
939.85	3.21
1022.29	3.48
1120.59	3.66
1239.8	3.71

Wavelength $\lambda$ (nm)	Extinction coefficient $k$ (-)
206.63	1.93
210.36	1.97
214.23	2

218.24	2.04
222.41	2.07
226.73	2.11
231.23	2.16
235.91	2.2
240.79	2.26
245.87	2.32
251.17	2.37
256.7	2.44
262.48	2.51
268.53	2.59
274.86	2.67
281.5	2.76
288.47	2.85
295.79	2.95
303.49	3.04
311.61	3.14
320.17	3.26
329.21	3.38
338.78	3.5
348.93	3.64
359.7	3.78
371.15	3.92
383.36	4.05
396.4	4.17
410.36	4.27
425.33	4.35
441.44	4.42
458.82	4.49
477.63	4.55
498.04	4.66
520.27	4.81
544.59	4.98
571.28	5.16
600.73	5.37
633.38	5.61
669.78	5.88
710.62	6.19
756.76	6.52
809.31	6.86
869.71	7.22
939.85	7.57
1022.29	7.9
1120.59	8.24
1239.8	8.67

# **RTC**

Wavelength $\lambda$ (nm)	Refractive index $n$ (-)
220	1.617859538
240	1.59341563
260	1.57582863
280	1.562768287
300	1.552808642
320	1.545040688
340	1.538864256
360	1.533870851
380	1.529774952
400	1.526372266
420	1.523513564
440	1.521087812

460	1.519011015
480	1.517218685
500	1.51566064
520	1.514297352
540	1.513097336
560	1.512035263
580	1.511090559
600	1.510246373
620	1.509488795
640	1.508806254
660	1.508189063
680	1.507629059
700	1.507119325
720	1.506653965
740	1.506227929
760	1.505836869
780	1.505477028
800	1.505145142
820	1.504838364
840	1.504554207
860	1.504290481
880	1.504045261
900	1.503816842
920	1.503603713
940	1.50340453
960	1.503218095
980	1.503043335
1000	1.50287929
1020	1.502725096
1040	1.502579975
1060	1.502443225

### Si (Silicon)

Wavelength $\lambda$ (nm)	Refractive index $n$ (-)
206.6333	1.01008
210.1356	1.08306
213.7586	1.13279
217.5088	1.18606
221.3929	1.2473
225.4182	1.33965
229.5926	1.47142
233.9245	1.57857
238.4231	1.58853
243.098	1.5712
247.96	1.57023
248.4569	1.5729
248.9558	1.57507
249.4567	1.5769
249.9597	1.57966
250.4646	1.58222
250.9717	1.58416
251.4807	1.58695
251.9919	1.59092
252.5051	1.5943
253.0204	1.5969
253.5378	1.60174
254.0574	1.60842
254.5791	1.61276
255.1029	1.61758
255.6289	1.62288

256.157	1.62898
256.6874	1.63614
257.2199	1.64322
257.7547	1.65016
258.2917	1.65763
258.8309	1.66534
259.3724	1.673
259.9161	1.68179
260.4622	1.69218
261.0105	1.70258
261.5612	1.71301
262.1142	1.72456
262.6695	1.73706
263.2272	1.75023
263.7872	1.76405
264.3497	1.7785
264.9145	1.79376
265.4818	1.81196
266.0515	1.83136
266.6237	1.85128
267.1983	1.87424
267.7754	1.90008
268.355	1.92741
268.9371	1.95639
269.5217	1.98794
270.1089	2.02176
270.6987	2.05918
271.291	2.09886
271.886	2.14044
272.4835	2.18557
273.0837	2.23419
273.6865	2.28509
274.292	2.33869
274.9002	2.39404
275.5111	2.45141
276.1247	2.51046
276.7411	2.57162
277.3602	2.6349
277.9821	2.69957
278.6068	2.76555
279.2342	2.8335
279.8646	2.90343
280.4977	2.97427
281.1338	3.04621
281.7727	3.12005
282.4146	3.19691
283.0594	3.27672
283.7071	3.35942
284.3578	3.44386
285.0115	3.53567
285.6682	3.63391
286.3279	3.73851
286.9908	3.84946
287.6566	3.96821
288.3256	4.0861
288.9977	4.20563
289.6729	4.31843
290.3513	4.42801
291.0329	4.52499
291.7177	4.61154



292.4056	4.68638
293.0969	4.74971
293.7915	4.80469
294.4893	4.85046
295.1905	4.88767
295.895	4.91827
296.6029	4.94054
297.3141	4.96037
298.0288	4.97693
298.747	4.98999
299.4686	4.99936
300.1937	5.00701
300.9223	5.01233
301.6545	5.01675
302.3902	5.01963
303.1296	5.02061
303.8725	5.02107
304.6192	5.02065
305.3694	5.02009
306.1234	5.01929
306.8812	5.0178
307.6427	5.01577
308.408	5.01477
309.1771	5.01318
309.95	5.01028
310.7268	5.00881
311.5075	5.00873
312.2922	5.00895
313.0808	5.00991
313.8734	5.00979
314.67	5.00901
315.4707	5.01033
316.2755	5.012
317.0844	5.01383
317.8974	5.01601
318.7147	5.01835
319.5361	5.02148
320.3618	5.02541
321.1917	5.02942
322.026	5.03379
322.8646	5.03978
323.7076	5.04596
324.555	5.05224
325.4068	5.05858
326.2632	5.06486
327.124	5.07173
327.9894	5.07904
328.8594	5.08687
329.734	5.09542
330.6133	5.10462
331.4973	5.11452
332.386	5.12443
333.2796	5.13447
334.1779	5.14471
335.0811	5.15556
335.9891	5.16671
336.9022	5.17888
337.8202	5.19199
338.7432	5.20438
339.6712	5.21648

340.6044	5.23113
341.5427	5.24614
342.4862	5.26126
343.4349	5.27784
344.3889	5.29553
345.3482	5.31486
346.3128	5.33551
347.2829	5.35843
348.2584	5.38336
349.2394	5.41074
350.226	5.44176
351.2181	5.47546
352.2159	5.51484
353.2194	5.55928
354.2285	5.61024
355.2436	5.66668
356.2644	5.7334
357.291	5.80893
358.3237	5.89392
359.3623	5.98673
360.407	6.08857
361.4577	6.19445
362.5146	6.30814
363.5777	6.41547
364.6471	6.52193
365.7227	6.61324
366.8047	6.69477
367.8932	6.75434
368.9881	6.79629
370.0895	6.82012
371.1976	6.82884
372.3123	6.8219
373.4337	6.79905
374.5619	6.75779
375.697	6.70892
376.8389	6.6486
377.9878	6.58516
379.1437	6.51996
380.3067	6.45206
382.6543	6.31568
385.031	6.18523
387.4375	6.06249
389.8742	5.94818
392.3418	5.84181
394.8408	5.74366
397.3718	5.65387
399.9355	5.56999
402.5325	5.49252
405.1634	5.42025
407.8289	5.3491
410.5298	5.28373
413.2667	5.22209
416.0403	5.16412
418.8513	5.10914
421.7007	5.05759
424.589	5.00943
427.5172	4.96138
430.4861	4.91576
433.4965	4.87249
436.5493	4.83055

439.6454	4.79134
442.7857	4.75305
445.9712	4.71765
449.2029	4.68157
452.4818	4.64809
455.8088	4.61468
459.1852	4.58301
462.6119	4.55282
466.0902	4.5225
469.6212	4.49448
473.2061	4.46625
476.8461	4.44209
480.5426	4.41575
484.2969	4.39112
488.1102	4.36729
491.9841	4.34338
495.92	4.32045
499.9193	4.29841
503.9837	4.27696
508.1147	4.25526
512.314	4.2354
516.5833	4.21481
520.9244	4.1962
525.339	4.17693
529.829	4.15909
534.3965	4.14041
539.0435	4.12266
543.7719	4.10584
548.584	4.08863
553.4821	4.07308
558.4684	4.05653
563.5454	4.04166
568.7156	4.02606
573.9814	4.0116
579.3458	3.99734
584.8113	3.98283
590.3809	3.96924
596.0577	3.9561
601.8447	3.9433
607.7451	3.93047
613.7624	3.9176
619.9	3.9057
623.0151	3.89916
626.1616	3.893
629.3401	3.88721
632.551	3.88154
635.7949	3.87587
639.0721	3.87031
642.3834	3.86449
645.7291	3.85827
649.1099	3.85244
652.5263	3.84672
655.9788	3.84152
659.4681	3.8367
662.9946	3.83122
666.5591	3.82573
670.1622	3.82037
673.8043	3.81513
677.4863	3.81001
681.2088	3.80528

684.9724	3.80094
688.7778	3.79647
692.6257	3.79199
696.5168	3.78737
700.452	3.78261
704.4318	3.77798
708.4572	3.77335
712.5287	3.76831
716.6474	3.76406
720.814	3.76047
725.0292	3.75648
729.2941	3.75221
733.6094	3.74835
737.9762	3.74488
742.3952	3.74073
746.8674	3.73632
751.3939	3.73163
755.9756	3.72761
760.6135	3.72412
765.3087	3.72076
770.0621	3.7178
774.875	3.7139
779.7484	3.70932
784.6835	3.70527
789.6815	3.70109
794.7436	3.69717
799.871	3.6927
805.0649	3.68755
810.3268	3.68375
815.6579	3.68104
821.0596	3.6771
826.5333	3.6726
1200.194	3.51923
1371.915	3.5007
1399.955	3.4876
1531.941	3.4784
1599.948	3.471
1696.033	3.4644
1799.942	3.4578
2000	3.449

Wavelength $\lambda$ (nm)	Extinction coefficient $k$ (-)
206.63333	2.90917
210.13559	2.98228
213.75862	3.0447
217.50877	3.11957
221.39285	3.20652
225.41818	3.30161
229.59259	3.36647
233.92452	3.35304
238.42307	3.35372
243.09803	3.42924
247.96	3.56477
248.45691	3.58064
248.95582	3.59762
249.45674	3.61533
249.95967	3.63212
250.46464	3.65026
250.97166	3.67009
251.48073	3.68977

251.99187	3.70918
252.50509	3.72891
253.0204	3.74914
253.53783	3.76903
254.05737	3.7888
254.57905	3.81209
255.10288	3.83505
255.62886	3.85704
256.15702	3.88002
256.68737	3.90371
257.21991	3.92825
257.75467	3.95386
258.29166	3.97916
258.83089	4.00429
259.37238	4.03137
259.91614	4.05936
260.46218	4.08821
261.01052	4.11786
261.56118	4.14854
262.11416	4.17961
262.66949	4.21086
263.22717	4.24374
263.78723	4.27795
264.34968	4.31347
264.91452	4.35035
265.48179	4.38751
266.0515	4.42593
266.62365	4.46556
267.19827	4.50608
267.77537	4.54745
268.35497	4.59009
268.93709	4.63405
269.52173	4.6777
270.10893	4.72139
270.69868	4.76427
271.29102	4.80689
271.88596	4.84948
272.48351	4.89139
273.0837	4.93311
273.68653	4.97289
274.29203	5.01114
274.90022	5.04732
275.51111	5.08177
276.12472	5.1156
276.74107	5.14754
277.36017	5.17781
277.98206	5.20602
278.60674	5.23223
279.23423	5.25745
279.86455	5.28185
280.49773	5.30399
281.13378	5.32432
281.77272	5.34366
282.41457	5.36221
283.05936	5.38069
283.70709	5.39766
284.35779	5.41398
285.01149	5.42613
285.6682	5.43547
286.32794	5.43907

286.99074	5.43869
287.65661	5.42335
288.32558	5.39511
288.99766	5.35437
289.67289	5.30065
290.35128	5.23214
291.03286	5.15747
291.71764	5.07369
292.40565	4.9886
293.09692	4.89967
293.79146	4.81207
294.48931	4.72419
295.19047	4.63933
295.89498	4.55811
296.60287	4.48028
297.31414	4.40582
298.02884	4.3346
298.74698	4.26744
299.46859	4.20424
300.1937	4.14369
300.92232	4.08613
301.6545	4.0311
302.39024	3.97928
303.12958	3.9311
303.87254	3.88473
304.61916	3.84044
305.36945	3.79833
306.12345	3.7585
306.88118	3.72026
307.64267	3.68388
308.40795	3.64992
309.17705	3.61746
309.94999	3.58663
310.72681	3.55713
311.50753	3.52894
312.29219	3.50223
313.0808	3.47681
313.87341	3.45254
314.67004	3.42932
315.47073	3.40696
316.2755	3.38558
317.08439	3.36549
317.89743	3.34609
318.71465	3.32759
319.53608	3.30958
320.36175	3.29237
321.1917	3.27523
322.02597	3.25838
322.86458	3.24181
323.70757	3.22595
324.55497	3.21125
325.40682	3.19645
326.26315	3.18163
327.124	3.16756
327.98941	3.15414
328.85941	3.14073
329.73404	3.12751
330.61333	3.11483
331.49732	3.10264
332.38605	3.09059

333.27956	3.07909
334.17789	3.06791
335.08107	3.05757
335.98915	3.04826
336.90217	3.03888
337.82016	3.02948
338.74316	3.02102
339.67123	3.01324
340.60439	3.00662
341.54269	3.00049
342.48618	2.99481
343.4349	2.99024
344.38888	2.98658
345.34818	2.98408
346.31284	2.98256
347.28291	2.98241
348.25842	2.98355
349.23943	2.98582
350.22598	2.98911
351.21812	2.99327
352.2159	2.99891
353.21937	3.00642
354.22856	3.01377
355.24355	3.02196
356.26436	3.02604
357.29106	3.02732
358.32369	3.02346
359.36231	3.00748
360.40697	2.98206
361.45772	2.93892
362.51461	2.88072
363.57771	2.80237
364.64705	2.7051
365.72271	2.58996
366.80473	2.4558
367.89317	2.31347
368.98809	2.16854
370.08955	2.01844
371.1976	1.86979
372.31231	1.71822
373.43373	1.57735
374.56193	1.44352
375.69696	1.32085
376.8389	1.20785
377.9878	1.11053
379.14372	1.02271
380.30674	0.94505
382.65431	0.81535
385.03105	0.7142
387.43749	0.62994
389.87421	0.5611
392.34176	0.50472
394.84076	0.45572
397.37179	0.41618
399.93548	0.38707
402.53246	0.35457
405.16339	0.32877
407.82894	0.31276
410.52979	0.29118
413.26666	0.26876

416.04026	0.25513
418.85134	0.24358
421.70067	0.22847
424.58903	0.2106
427.51723	0.20327
430.4861	0.19407
433.4965	0.18471
436.54929	0.18497
439.64538	0.1701
442.78571	0.16284
445.97121	0.14912
449.20289	0.14856
452.48174	0.13328
455.80881	0.13143
459.18518	0.13026
462.61193	0.13091
466.09022	0.13411
469.6212	0.1197
473.2061	0.12001
476.84614	0.09039
480.54263	0.09398
484.29687	0.08335
488.11023	0.07911
491.98412	0.0769
495.91999	0.07291
499.91935	0.07317
503.98373	0.0664
508.11474	0.0725
512.31404	0.06032
516.58332	0.06026
520.92436	0.05553
525.33897	0.05255
529.82905	0.04508
534.39654	0.0448
539.04347	0.04803
543.77192	0.04372
548.58406	0.04378
553.48213	0.03155
558.46846	0.03833
563.54544	0.03216
568.71559	0.03415
573.98147	0.03004
579.34578	0.02752
584.81131	0.03025
590.38094	0.02973
596.05768	0.02717
601.84465	0.02498
607.74509	0.02455
613.76236	0.02361
619.89999	0.02202
623.01506	0.02206
626.1616	0.02145
629.34009	0.02058
632.55101	0.01945
635.79486	0.01858
639.07215	0.0177
642.38341	0.01708
645.72915	0.01685
649.10994	0.01648
652.5263	0.01638



655.97882	0.01614
659.46807	0.01577
662.99464	0.0154
666.55913	0.0149
670.16215	0.0144
673.80433	0.01402
677.48633	0.01378
681.20878	0.0134
684.97236	0.01329
688.77776	0.01304
692.62569	0.01279
696.51684	0.01254
700.45196	0.01216
704.4318	0.01191
708.45713	0.01166
712.52872	0.01141
716.64739	0.01116
720.81394	0.0109
725.02923	0.01065
729.2941	0.01039
733.60945	0.01027
737.97618	0.00988
742.3952	0.00962
746.86746	0.00937
751.39393	0.00911
755.9756	0.00872
760.61348	0.00846
765.30863	0.0082
770.0621	0.00793
774.87499	0.00767
779.74841	0.00741
784.68353	0.00715
789.68151	0.00689
794.74357	0.00663
799.87095	0.00636
805.06492	0.0061
810.32678	0.00584
815.65788	0.00557
821.05959	0.00544
826.53332	0.00517
1200.19359	0
1371.91543	0
1399.95481	0
1531.94115	0
1599.94835	0
1696.0328	0
1799.94189	0
1999.99996	0

#### Si-alpha (Amorphous silicon)

Wavelength $\lambda$ (nm)	Refractive index $n$ (-)
200.82	1.12580180168152
209.02	1.2279657125473
217.22	1.33721137046814
225.42	1.45370733737946
233.62	1.57753443717957
241.82	1.70865297317505
250.02	1.84686601161957
258.22	1.99178290367126
266.42	2.14278316497803

274.62	2.29899024963379
282.82	2.45925211906433
291.02	2.62214541435242
299.22	2.78599977493286
307.42	2.94895100593567
315.62	3.10901713371277
323.82	3.26419806480408
332.02	3.41258502006531
340.22	3.55246448516846
348.42	3.68241238594055
356.62	3.80135679244995
364.82	3.90860939025879
373.02	4.0038628578186
381.22	4.08716297149658
389.42	4.158851146698
397.62	4.21950483322144
405.82	4.26986932754517
414.02	4.31079578399658
422.22	4.34318733215332
430.42	4.36795282363892
438.62	4.38597917556763
446.82	4.3981032371521
455.02	4.40510034561157
463.22	4.4076771736145
471.42	4.40646743774414
479.62	4.40203475952148
487.82	4.39487457275391
496.02	4.38542127609253
504.22	4.37405157089233
512.42	4.36109066009521
520.62	4.34682083129883
528.82	4.33148241043091
537.02	4.31528186798096
545.22	4.29839611053467
553.42	4.28097534179688
561.62	4.26314830780029
569.82	4.24502372741699
578.02	4.22669363021851
586.22	4.20823621749878
594.42	4.18971824645996
602.62	4.17119550704956
610.82	4.15271472930908
619.02	4.13431644439697
627.22	4.11603307723999
635.42	4.09789228439331
643.62	4.07991790771484
651.82	4.06212949752808
660.02	4.04454231262207
668.22	4.02716970443726
676.42	4.01002264022827
684.62	3.99311017990112
692.82	3.97643852233887
701.02	3.96001434326172
709.22	3.94384145736694
717.42	3.92792344093323
725.62	3.91226315498352
733.82	3.89686298370361
742.02	3.88172364234924
750.22	3.86684656143188
758.42	3.85223317146301

766.62	3.83788275718689
774.82	3.82379674911499
783.02	3.80997467041016
791.22	3.7964174747467
799.42	3.78312492370605
807.62	3.77009749412537
815.82	3.75733542442322
824.02	3.74483942985535
832.22	3.73261070251465
840.42	3.72064971923828
848.62	3.70895838737488
856.82	3.69753861427307
865.02	3.68639206886292
873.22	3.67552208900452
881.42	3.6649317741394
889.62	3.65462589263916
897.82	3.64460945129395
906.02	3.6348888874054
914.22	3.62547278404236
922.42	3.61637163162231
930.62	3.60759973526001
938.82	3.59917759895325
947.02	3.59113717079163
955.22	3.5835542678833
963.42	3.57650351524353
971.62	3.56984543800354
979.82	3.56351613998413
988.02	3.55747604370117
996.22	3.55169677734375
1004.42	3.54615569114685
1012.62	3.5408341884613

Wavelength $\lambda$ (nm)	Extinction coefficient $k$ (-)
200.82	2.267911195755
209.02	2.36514282226563
217.22	2.45803999900818
225.42	2.54589581489563
233.62	2.62788081169128
241.82	2.70304918289185
250.02	2.77035427093506
258.22	2.82867550849915
266.42	2.87685441970825
274.62	2.91374850273132
282.82	2.93829464912415
291.02	2.94958448410034
299.22	2.94694447517395
307.42	2.93000936508179
315.62	2.89878392219543
323.82	2.85367703437805
332.02	2.79550433158875
340.22	2.72545719146729
348.42	2.64503359794617
356.62	2.55595088005066
364.82	2.46004199981689
373.02	2.35915374755859
381.22	2.25505495071411
389.42	2.14936828613281
397.62	2.04352235794067
405.82	1.93872439861298
414.02	1.83595824241638

422.22	1.73599004745483
430.42	1.63939106464386
438.62	1.54655838012695
446.82	1.45774614810944
455.02	1.37308883666992
463.22	1.29262721538544
471.42	1.21632957458496
479.62	1.14411067962646
487.82	1.07584524154663
496.02	1.01138234138489
504.22	.950553953647614
512.42	.89318311214447
520.62	.839088559150696
528.82	.788090169429779
537.02	.74001133441925
545.22	.69468104839325
553.42	.651935577392578
561.62	.611619293689728
569.82	.573585152626038
578.02	.537694215774536
586.22	.503816783428192
594.42	.471831411123276
602.62	.441624611616135
610.82	.413090914487839
619.02	.386131793260574
627.22	.360655903816223
635.42	.336578279733658
643.62	.313819795846939
651.82	.292307108640671
660.02	.271972000598907
668.22	.252751111984253
676.42	.234585583209991
684.62	.217420309782028
692.82	.201204434037209
701.02	.185890391469002
709.22	.171433925628662
717.42	.157793775200844
725.62	.144931375980377
733.82	.13281075656414
742.02	.121398314833641
750.22	.110662586987019
758.42	.100574120879173
766.62	9.11053568124771E-02
774.82	8.22304040193558E-02
783.02	7.39250034093857E-02
791.22	.066166378557682
799.42	5.89329823851585E-02
807.62	.052204679697752
815.82	4.59624454379082E-02
824.02	4.01883460581303E-02
832.22	3.48654352128506E-02
840.42	2.99777239561081E-02
848.62	.025510061532259
856.82	2.14481130242348E-02
865.02	1.77782885730267E-02
873.22	1.44876856356859E-02
881.42	1.15640461444855E-02
889.62	8.99570342153311E-03
897.82	6.77155982702971E-03
906.02	4.88098664209247E-03

914.22	3.31387226469815E-03
922.42	2.06052814610302E-03
930.62	1.11166713759303E-03
938.82	4.58370777778327E-04
947.02	9.20553575269878E-05
955.22	0
963.42	0
971.62	0
979.82	0
988.02	0
996.22	0
1004.42	0
1012.62	0

### Si-poly (Polycrystalline silicon)

Wavelength $\lambda$ (nm)	Refractive index $n$ (-)
200.82	.963995397090912
209.02	1.09218037128448
217.22	1.22769057750702
225.42	1.36170780658722
233.62	1.48908364772797
241.82	1.58198118209839
250.02	1.6181948184967
258.22	1.69850432872772
266.42	1.88037991523743
274.62	2.23525309562683
282.82	2.9053738117218
291.02	3.86724972724915
299.22	4.34491920471191
307.42	4.35047817230225
315.62	4.34600162506104
323.82	4.40645694732666
332.02	4.53823089599609
340.22	4.72492456436157
348.42	4.95296335220337
356.62	5.22372388839722
364.82	5.61768579483032
373.02	5.78224086761475
381.22	5.55178594589233
389.42	5.30713796615601
397.62	5.11498785018921
405.82	4.96753740310669
414.02	4.85168361663818
422.22	4.75779724121094
430.42	4.67946481704712
438.62	4.61243963241577
446.82	4.55386734008789
455.02	4.50178575515747
463.22	4.45481824874878
471.42	4.41197395324707
479.62	4.37252855300903
487.82	4.33593940734863
496.02	4.30179119110107
504.22	4.26976299285889
512.42	4.23959875106812
520.62	4.21109247207642
528.82	4.1840763092041
537.02	4.15840816497803
545.22	4.13397026062012
553.42	4.11066055297852

561.62	4.08839225769043
569.82	4.06708812713623
578.02	4.04667854309082
586.22	4.02710485458374
594.42	4.0083122253418
602.62	3.99025225639343
610.82	3.97288036346436
619.02	3.95615696907043
627.22	3.94004392623901
635.42	3.92450881004334
643.62	3.9095196723938
651.82	3.89504861831665
660.02	3.88106846809387
668.22	3.86755537986755
676.42	3.85448598861694
684.62	3.84183955192566
692.82	3.82959628105164
701.02	3.81773781776428
709.22	3.80624747276306
717.42	3.79510879516602
725.62	3.78430724143982
733.82	3.77382898330688
742.02	3.7636604309082
750.22	3.75379014015198
758.42	3.74420642852783
766.62	3.73489856719971
774.82	3.72585654258728
783.02	3.71707153320313
791.22	3.70853447914124
799.42	3.70023679733276
807.62	3.69217133522034
815.82	3.68433117866516
824.02	3.67670941352844
832.22	3.6693000793457
840.42	3.66209721565247
848.62	3.65509605407715
856.82	3.64829158782959
865.02	3.64167928695679
873.22	3.63525533676147
881.42	3.62901616096497
889.62	3.62295913696289
897.82	3.61708188056946
906.02	3.6113817691803
914.22	3.60585856437683
922.42	3.60051155090332
930.62	3.59534192085266
938.82	3.5903525352478
947.02	3.58555030822754
955.22	3.58095502853394
963.42	3.57658624649048
971.62	3.57239890098572
979.82	3.56837201118469
988.02	3.56449127197266
996.22	3.56074571609497
1004.42	3.55712628364563
1012.62	3.55362558364868

Wavelength $\lambda$ (nm)	Extinction coefficient $k$ (-)
200.82	2.64001083374023
209.02	2.78805255889893

217.22	2.91922497749329
225.42	3.03521943092346
233.62	3.14283752441406
241.82	3.23249077796936
250.02	3.41121602058411
258.22	3.70270609855652
266.42	4.07716178894043
274.62	4.49871635437012
282.82	4.79637241363525
291.02	4.50015687942505
299.22	3.87100982666016
307.42	3.45212888717651
315.62	3.22851586341858
323.82	3.1311571598053
332.02	3.07245850563049
340.22	3.00588083267212
348.42	2.90903997421265
356.62	2.76945805549622
364.82	2.53405356407166
373.02	1.81327140331268
381.22	1.25225722789764
389.42	.926511466503143
397.62	.727108120918274
405.82	.594811081886292
414.02	.501137614250183
422.22	.431466966867447
430.42	.377671748399735
438.62	.334907084703445
446.82	.300114542245865
455.02	.271269291639328
463.22	.246977761387825
471.42	.226249486207962
479.62	.208360478281975
487.82	.192769214510918
496.02	.179062768816948
504.22	.166920468211174
512.42	.156089767813683
520.62	.146368861198425
528.82	.137594684958458
537.02	.129634156823158
545.22	.122377507388592
553.42	.115733444690704
561.62	.109625570476055
569.82	.103989310562611
578.02	9.87698808312416E-02
586.22	.093920424580574
594.42	8.94006937742233E-02
602.62	.085175946354866
610.82	.081216037273407
619.02	7.74946436285973E-02
627.22	7.39887580275536E-02
635.42	7.06781595945358E-02
643.62	6.75450265407562E-02
651.82	6.45735561847687E-02
660.02	6.17497377097607E-02
668.22	5.90610913932323E-02
676.42	5.64965046942234E-02
684.62	5.40459416806698E-02
692.82	5.17004802823067E-02
701.02	4.94520515203476E-02

709.22	4.72933910787106E-02
717.42	.04521793872118
725.62	4.32197600603104E-02
733.82	4.12934683263302E-02
742.02	3.94341833889484E-02
750.22	3.76374796032906E-02
758.42	3.58993262052536E-02
766.62	3.42160649597645E-02
774.82	3.25843915343285E-02
783.02	3.10012847185135E-02
791.22	2.94640623033047E-02
799.42	.027970265597105
807.62	2.65177395194769E-02
815.82	2.51045804470778E-02
824.02	2.37291660159826E-02
832.22	2.23901513963938E-02
840.42	2.10864972323179E-02
848.62	1.98175217956305E-02
856.82	1.85829661786556E-02
865.02	1.73831023275852E-02
873.22	1.62188969552517E-02
881.42	1.50922564789653E-02
889.62	1.40064116567373E-02
897.82	1.29665415734053E-02
906.02	1.19806658476591E-02
914.22	1.10611170530319E-02
922.42	.010226565413177
930.62	9.5044057816267E-03
938.82	8.93194973468781E-03
947.02	8.55212286114693E-03
955.22	8.39487835764885E-03
963.42	8.31825006753206E-03
971.62	8.24378989636898E-03
979.82	8.17143823951483E-03
988.02	8.10112431645393E-03
996.22	8.0327745527029E-03
1004.42	7.96631723642349E-03
1012.62	7.90167879313231E-03

### Si-Poly-Brugg

Wavelength $\lambda$ (nm)	Refractive index $n$ (-)
200.82	1.04627084732056
209.02	1.15856468677521
217.22	1.27822661399841
225.42	1.40139949321747
233.62	1.52561569213867
241.82	1.63878285884857
250.02	1.72531259059906
258.22	1.82709193229675
266.42	1.96926879882813
274.62	2.18288993835449
282.82	2.54046583175659
291.02	3.08931255340576
299.22	3.38034677505493
307.42	3.36878752708435
315.62	3.53973197937012
323.82	3.68833756446838
332.02	3.84539937973022
340.22	4.01026058197021
348.42	4.17989158630371



356.62	4.35446262359619
364.82	4.55594921112061
373.02	4.62465715408325
381.22	4.56124639511108
389.42	4.5073037147522
397.62	4.47538566589355
405.82	4.45704555511475
414.02	4.44546270370483
422.22	4.43662786483765
430.42	4.42835283279419
438.62	4.41950559616089
446.82	4.4095516204834
455.02	4.39829206466675
463.22	4.38571548461914
471.42	4.37191009521484
479.62	4.35701322555542
487.82	4.34118175506592
496.02	4.32457447052002
504.22	4.30734205245972
512.42	4.28962326049805
520.62	4.27154397964478
528.82	4.25321292877197
537.02	4.23472452163696
545.22	4.21616172790527
553.42	4.19759321212769
561.62	4.17907810211182
569.82	4.16066598892212
578.02	4.14239645004272
586.22	4.12430381774902
594.42	4.10641574859619
602.62	4.08875465393066
610.82	4.07133674621582
619.02	4.05417776107788
627.22	4.03728771209717
635.42	4.02067375183105
643.62	4.00434303283691
651.82	3.98829865455627
660.02	3.97254252433777
668.22	3.95707654953003
676.42	3.94190001487732
684.62	3.92701268196106
692.82	3.91241192817688
701.02	3.89809703826904
709.22	3.88406467437744
717.42	3.87031173706055
725.62	3.85683608055115
733.82	3.84363436698914
742.02	3.83070254325867
750.22	3.81803798675537
758.42	3.8056378364563
766.62	3.79349780082703
774.82	3.78161573410034
783.02	3.76998829841614
791.22	3.75861287117004
799.42	3.74748659133911
807.62	3.73660707473755
815.82	3.72597169876099
824.02	3.71557927131653
832.22	3.70542788505554
840.42	3.69551563262939

848.62	3.68584179878235
856.82	3.6764063835144
865.02	3.66720795631409
873.22	3.65824723243713
881.42	3.6495246887207
889.62	3.64104199409485
897.82	3.63280129432678
906.02	3.62480521202087
914.22	3.61705875396729
922.42	3.60956764221191
930.62	3.60234045982361
938.82	3.59539008140564
947.02	3.58873796463013
955.22	3.58243584632874
963.42	3.57653474807739
971.62	3.57093572616577
979.82	3.56559300422668
988.02	3.56047797203064
996.22	3.55557012557983
1004.42	3.55085206031799
1012.62	3.54631066322327

Wavelength $\lambda$ (nm)	Extinction coefficient $k$ (-)
200.82	2.43691825866699
209.02	2.5584077835083
217.22	2.66935992240906
225.42	2.77019262313843
233.62	2.86383366584778
241.82	2.9452006816864
250.02	3.06429100036621
258.22	3.23395252227783
266.42	3.44280743598938
274.62	3.67116284370422
282.82	3.81143188476563
291.02	3.59830689430237
299.22	3.34515285491943
307.42	3.27855968475342
315.62	3.09634733200073
323.82	3.00317430496216
332.02	2.93245220184326
340.22	2.85844898223877
348.42	2.76933622360229
356.62	2.65955066680908
364.82	2.50913310050964
373.02	2.13678598403931
381.22	1.79753816127777
389.42	1.56636798381805
397.62	1.40464890003204
405.82	1.28265058994293
414.02	1.1841299533844
422.22	1.1004204750061
430.42	1.02676546573639
438.62	.960444629192352
446.82	.899832010269165
455.02	.843905746936798
463.22	.791987419128418
471.42	.743599712848663
479.62	.698385834693909
487.82	.656063258647919
496.02	.616398513317108

504.22	.579190731048584
512.42	.54426234960556
520.62	.511453568935394
528.82	.4806187748909
537.02	.451624482870102
545.22	.424347460269928
553.42	.398673892021179
561.62	.374498575925827
569.82	.351723849773407
578.02	.33025923371315
586.22	.310021132230759
594.42	.290931940078735
602.62	.272919893264771
610.82	.255918592214584
619.02	.23986628651619
627.22	.22470586001873
635.42	.210384473204613
643.62	.196852937340736
651.82	.184065788984299
660.02	.17198072373867
668.22	.160558432340622
676.42	.149762496352196
684.62	.139558747410774
692.82	.129915609955788
701.02	.120803527534008
709.22	.112194940447807
717.42	.104064106941223
725.62	9.63868722319603E-02
733.82	8.91406461596489E-02
742.02	8.23042169213295E-02
750.22	7.58576393127441E-02
758.42	6.97821229696274E-02
766.62	6.40599653124809E-02
774.82	5.86744137108326E-02
783.02	5.36096133291721E-02
791.22	4.88505400717258E-02
799.42	4.43828292191029E-02
807.62	4.01928722858429E-02
815.82	3.62676307559013E-02
824.02	3.25946137309074E-02
832.22	2.91618425399065E-02
840.42	2.59577855467796E-02
848.62	2.29713171720505E-02
856.82	2.01916880905628E-02
865.02	1.76085010170937E-02
873.22	1.52116632089019E-02
881.42	1.29913929849863E-02
889.62	1.09381899237633E-02
897.82	9.04286373406649E-03
906.02	7.29650352150202E-03
914.22	5.69060910493135E-03
922.42	4.21722372993827E-03
930.62	.002869465155527
938.82	1.64372567087412E-03
947.02	5.56046608835459E-04
955.22	6.42462645583652E-12
963.42	-1.45069954313182E-11
971.62	1.01814199432448E-11
979.82	8.86827243584687E-12
988.02	-5.48668098801497E-12

996.22	6.35098744428131E-12
1004.42	-7.96997277202616E-12
1012.62	-9.16093242930849E-12

#### **Si<sub>3</sub>N<sub>4</sub> (k=0) (Silicon nitride)**

Wavelength $\lambda$ (nm)	Refractive index $n$ (-)
206.6333	2.541
215.6174	2.464
225.4182	2.393
236.1524	2.331
247.96	2.278
261.0105	2.234
275.5111	2.198
291.7177	2.167
309.95	2.141
354.2285	2.099
413.2667	2.066
495.92	2.041
619.9	2.022
826.5333	2.008
1239.8	1.998

Wavelength $\lambda$ (nm)	Extinction coefficient $k$ (-)
206.6333	0
215.6174	0
225.4182	0
236.1524	0
247.96	0
261.0105	0
275.5111	0
291.7177	0
309.95	0
354.2285	0
413.2667	0
495.92	0
619.9	0
826.5333	0
1239.8	0

#### **Si<sub>3</sub>N<sub>4</sub> (Silicon nitride)**

Wavelength $\lambda$ (nm)	Refractive index $n$ (-)
219.5	2.5474
220.51	2.5788
221.53	2.6077
222.54	2.634
223.55	2.6577
224.56	2.6789
225.57	2.6976
226.59	2.7141
227.6	2.7283
228.61	2.7404
229.62	2.7506
230.63	2.759
231.63	2.7657
232.64	2.7708
233.65	2.7745
234.66	2.777
235.67	2.7783
236.68	2.7786

237.68	2.7779
238.69	2.7764
239.7	2.7742
240.7	2.7714
241.71	2.7679
242.71	2.764
243.72	2.7597
244.72	2.7549
245.73	2.7499
246.73	2.7446
247.73	2.739
248.74	2.7333
249.74	2.7274
250.74	2.7214
251.75	2.7153
252.75	2.7091
253.75	2.7028
254.75	2.6965
255.75	2.6903
256.75	2.684
257.75	2.6777
258.75	2.6714
259.75	2.6652
260.75	2.659
261.75	2.6528
262.75	2.6467
263.75	2.6407
264.75	2.6347
265.74	2.6288
266.74	2.623
267.74	2.6172
268.73	2.6115
269.73	2.6059
270.73	2.6004
271.72	2.5949
272.72	2.5895
273.71	2.5842
274.71	2.579
275.7	2.5739
276.69	2.5688
277.69	2.5639
278.68	2.559
279.67	2.5541
280.66	2.5494
281.66	2.5447
282.65	2.5401
283.64	2.5356
284.63	2.5312
285.62	2.5268
286.61	2.5225
287.6	2.5183
288.59	2.5142
289.58	2.5101
290.57	2.506
291.56	2.5021
292.55	2.4982
293.54	2.4944
294.52	2.4906
295.51	2.4869
296.5	2.4833

297.48	2.4797
298.47	2.4762
299.46	2.4727
300.44	2.4693
301.43	2.4659
302.41	2.4626
303.4	2.4594
304.38	2.4562
305.36	2.453
306.35	2.4499
307.33	2.4469
308.31	2.4439
309.3	2.4409
310.28	2.438
311.26	2.4351
312.24	2.4323
313.22	2.4295
314.2	2.4268
315.18	2.4241
316.16	2.4214
317.14	2.4188
318.12	2.4162
319.1	2.4137
320.08	2.4112
321.06	2.4087
322.04	2.4063
323.02	2.4039
323.99	2.4015
324.97	2.3992
325.95	2.3969
326.92	2.3946
327.9	2.3924
328.87	2.3902
329.85	2.388
330.82	2.3858
331.8	2.3837
332.77	2.3816
333.75	2.3796
334.72	2.3775
335.69	2.3755
336.67	2.3736
337.64	2.3716
338.61	2.3697
339.58	2.3678
340.56	2.3659
341.53	2.3641
342.5	2.3622
343.47	2.3604
344.44	2.3587
345.41	2.3569
346.38	2.3552
347.35	2.3534
348.32	2.3518
349.28	2.3501
350.25	2.3484
351.22	2.3468
352.19	2.3452
353.16	2.3436
354.12	2.342
355.09	2.3405

356.05	2.3389
357.02	2.3374
357.99	2.3359
358.95	2.3344
359.92	2.333
360.88	2.3315
361.84	2.3301
362.81	2.3287
363.77	2.3273
364.73	2.3259
365.7	2.3245
366.66	2.3232
367.62	2.3219
368.58	2.3205
369.54	2.3192
370.51	2.3179
371.47	2.3167
372.43	2.3154
373.39	2.3141
374.35	2.3129
375.3	2.3117
376.26	2.3105
377.22	2.3093
378.18	2.3081
379.14	2.3069
380.1	2.3058
381.05	2.3046
382.01	2.3035
382.97	2.3024
383.92	2.3012
384.88	2.3001
385.83	2.299
386.79	2.298
387.74	2.2969
388.7	2.2958
389.65	2.2948
390.61	2.2938
391.56	2.2927
392.51	2.2917
393.47	2.2907
394.42	2.2897
395.37	2.2887
396.32	2.2878
397.27	2.2868
398.22	2.2858
399.18	2.2849
400.13	2.2839
401.08	2.283
402.03	2.2821
402.97	2.2812
403.92	2.2803
404.87	2.2794
405.82	2.2785
406.77	2.2776
407.72	2.2767
408.66	2.2759
409.61	2.275
410.56	2.2742
411.5	2.2733
412.45	2.2725

413.39	2.2717
414.34	2.2709
415.29	2.2701
416.23	2.2693
417.17	2.2685
418.12	2.2677
419.06	2.2669
420	2.2661
420.95	2.2653
421.89	2.2646
422.83	2.2638
423.77	2.2631
424.72	2.2623
425.66	2.2616
426.6	2.2609
427.54	2.2601
428.48	2.2594
429.42	2.2587
430.36	2.258
431.3	2.2573
432.24	2.2566
433.17	2.2559
434.11	2.2552
435.05	2.2546
435.99	2.2539
436.92	2.2532
437.86	2.2526
438.8	2.2519
439.73	2.2513
440.67	2.2506
441.6	2.25
442.54	2.2494
443.47	2.2487
444.41	2.2481
445.34	2.2475
446.28	2.2469
447.21	2.2463
448.14	2.2457
449.07	2.2451
450.01	2.2445
450.94	2.2439
451.87	2.2433
452.8	2.2427
453.73	2.2421
454.66	2.2415
455.59	2.241
456.52	2.2404
457.45	2.2399
458.38	2.2393
459.31	2.2387
460.24	2.2382
461.17	2.2377
462.09	2.2371
463.02	2.2366
463.95	2.2361
464.88	2.2355
465.8	2.235
466.73	2.2345
467.65	2.234
468.58	2.2335



469.5	2.2329
470.43	2.2324
471.35	2.2319
472.28	2.2314
473.2	2.231
474.13	2.2305
475.05	2.23
475.97	2.2295
476.89	2.229
477.82	2.2285
478.74	2.2281
479.66	2.2276
480.58	2.2271
481.5	2.2267
482.42	2.2262
483.34	2.2258
484.26	2.2253
485.18	2.2249
486.1	2.2244
487.02	2.224
487.93	2.2235
488.85	2.2231
489.77	2.2226
490.69	2.2222
491.6	2.2218
492.52	2.2214
493.44	2.2209
494.35	2.2205
495.27	2.2201
496.18	2.2197
497.1	2.2193
498.01	2.2189
498.93	2.2185
499.84	2.2181
500.75	2.2177
501.67	2.2173
502.58	2.2169
503.49	2.2165
504.4	2.2161
505.32	2.2157
506.23	2.2153
507.14	2.2149
508.05	2.2145
508.96	2.2142
509.87	2.2138
510.78	2.2134
511.69	2.2131
512.6	2.2127
513.51	2.2123
514.42	2.212
515.32	2.2116
516.23	2.2112
517.14	2.2109
518.05	2.2105
518.95	2.2102
519.86	2.2098
520.76	2.2095
521.67	2.2091
522.57	2.2088
523.48	2.2085

524.38	2.2081
525.29	2.2078
526.19	2.2075
527.1	2.2071
528	2.2068
528.9	2.2065
529.8	2.2061
530.71	2.2058
531.61	2.2055
532.51	2.2052
533.41	2.2049
534.31	2.2045
535.21	2.2042
536.11	2.2039
537.01	2.2036
537.91	2.2033
538.81	2.203
539.71	2.2027
540.61	2.2024
541.51	2.2021
542.4	2.2018
543.3	2.2015
544.2	2.2012
545.1	2.2009
545.99	2.2006
546.89	2.2003
547.78	2.2001
548.68	2.1998
549.57	2.1995
550.47	2.1992
551.36	2.1989
552.26	2.1987
553.15	2.1984
554.04	2.1981
554.94	2.1978
555.83	2.1976
556.72	2.1973
557.61	2.197
558.51	2.1968
559.4	2.1965
560.29	2.1962
561.18	2.196
562.07	2.1957
562.96	2.1955
563.85	2.1952
564.74	2.1949
565.63	2.1947
566.51	2.1944
567.4	2.1942
568.29	2.1939
569.18	2.1937
570.06	2.1935
570.95	2.1932
571.84	2.193
572.72	2.1927
573.61	2.1925
574.5	2.1923
575.38	2.192
576.26	2.1918
577.15	2.1916

578.03	2.1913
578.92	2.1911
579.8	2.1909
580.68	2.1906
581.57	2.1904
582.45	2.1902
583.33	2.19
584.21	2.1898
585.09	2.1895
585.97	2.1893
586.86	2.1891
587.74	2.1889
588.62	2.1887
589.5	2.1885
590.37	2.1883
591.25	2.1881
592.13	2.1878
593.01	2.1876
593.89	2.1874
594.77	2.1872
595.64	2.187
596.52	2.1868
597.4	2.1866
598.27	2.1864
598.85	2.1863
599.76	2.1861
600.67	2.1859
601.59	2.1857
602.5	2.1855
603.41	2.1853
604.33	2.1851
605.24	2.185
606.59	2.1847
607.5	2.1845
608.41	2.1843
609.32	2.1841
610.23	2.1839
611.14	2.1837
612.05	2.1836
612.96	2.1834
613.87	2.1832
614.77	2.183
615.68	2.1828
616.59	2.1827
617.93	2.1824
618.84	2.1822
619.74	2.1821
620.65	2.1819
621.55	2.1817
622.46	2.1816
623.36	2.1814
624.27	2.1812
625.17	2.1811
626.08	2.1809
626.98	2.1807
628.31	2.1805
629.22	2.1803
630.12	2.1802
631.02	2.18
631.92	2.1799

632.82	2.1797
633.72	2.1796
634.62	2.1794
635.52	2.1792
636.42	2.1791
637.32	2.1789
638.65	2.1787
639.55	2.1786
640.45	2.1784
641.34	2.1783
642.24	2.1781
643.14	2.178
644.03	2.1778
644.93	2.1777
645.82	2.1775
646.72	2.1774
647.61	2.1773
648.94	2.1771
649.83	2.1769
650.72	2.1768
651.62	2.1766
652.51	2.1765
653.4	2.1764
654.3	2.1762
655.19	2.1761
656.08	2.176
656.97	2.1758
657.86	2.1757
658.75	2.1756
660.07	2.1754
660.96	2.1752
661.84	2.1751
662.73	2.175
663.62	2.1748
664.51	2.1747
665.4	2.1746
666.28	2.1745
667.17	2.1743
668.06	2.1742
668.94	2.1741
670.25	2.1739
671.14	2.1738
672.02	2.1737
672.91	2.1735
673.79	2.1734
674.67	2.1733
675.56	2.1732
676.44	2.1731
677.32	2.173
678.21	2.1728
679.09	2.1727
680.39	2.1725
681.27	2.1724
682.15	2.1723
683.03	2.1722
683.91	2.1721
684.79	2.172
685.67	2.1719
686.55	2.1718
687.43	2.1716

688.31	2.1715
689.18	2.1714
690.48	2.1713
690.98	2.1712
691.9	2.1711
692.81	2.171
693.73	2.1709
694.64	2.1708
695.55	2.1706
696.46	2.1705
697.38	2.1704
698.29	2.1703
699.2	2.1702
700.11	2.1701
701.02	2.17
701.93	2.1699
702.84	2.1698
703.75	2.1697
704.66	2.1696
705.56	2.1695
706.47	2.1694
707.38	2.1693
708.29	2.1692
709.19	2.1691
710.1	2.169
711	2.1689
711.91	2.1688
712.82	2.1687
713.72	2.1686
714.62	2.1685
715.53	2.1684
716.43	2.1683
717.34	2.1682
718.24	2.1681
719.14	2.168
720.04	2.1679
720.94	2.1678
721.85	2.1677
722.75	2.1676
723.65	2.1675
724.55	2.1674
725.45	2.1673
726.35	2.1672
727.24	2.1671
728.14	2.167
729.04	2.1669
729.94	2.1668
730.84	2.1668
731.73	2.1667
732.63	2.1666
733.52	2.1665
734.42	2.1664
735.32	2.1663
736.21	2.1662
737.11	2.1661
738	2.166
738.89	2.166
739.79	2.1659
740.68	2.1658
741.57	2.1657

742.46	2.1656
743.36	2.1655
744.25	2.1654
745.14	2.1654
746.03	2.1653
746.92	2.1652
747.81	2.1651
748.7	2.165
749.59	2.1649
750.48	2.1649
751.36	2.1648
752.25	2.1647
753.14	2.1646
754.03	2.1645
754.91	2.1645
755.8	2.1644
756.69	2.1643
757.57	2.1642
758.46	2.1641
759.34	2.1641
760.23	2.164
761.11	2.1639
761.99	2.1638
762.88	2.1638
763.76	2.1637
764.64	2.1636
765.52	2.1635
766.4	2.1635
767.29	2.1634
768.17	2.1633
769.05	2.1632
769.93	2.1632
770.81	2.1631
771.69	2.163
772.56	2.1629
773.44	2.1629
774.32	2.1628
775.2	2.1627
776.08	2.1627
776.95	2.1626
777.83	2.1625
778.71	2.1624
779.58	2.1624
780.46	2.1623
781.33	2.1622
782.21	2.1622
783.08	2.1621
783.95	2.162
784.83	2.162
785.7	2.1619
786.57	2.1618
787.44	2.1617
788.32	2.1617
789.19	2.1616
790.06	2.1615
790.93	2.1615
791.8	2.1614
792.67	2.1613
793.54	2.1613
794.41	2.1612

795.28	2.1612
796.14	2.1611
797.01	2.161
797.88	2.161
798.75	2.1609
799.61	2.1608
800.48	2.1608
801.35	2.1607
802.21	2.1606
803.08	2.1606
803.94	2.1605
804.81	2.1605
805.67	2.1604
806.53	2.1603
807.4	2.1603
808.26	2.1602
809.12	2.1601
809.98	2.1601
810.84	2.16
811.71	2.16
812.57	2.1599
813.43	2.1598
814.29	2.1598
815.15	2.1597
816.01	2.1597
816.86	2.1596
817.72	2.1595
818.58	2.1595
819.44	2.1594
820.3	2.1594
821.15	2.1593
822.01	2.1593
822.87	2.1592
823.72	2.1591
824.58	2.1591
825.43	2.159
826.29	2.159
827.14	2.1589
827.99	2.1589
828.85	2.1588
829.7	2.1588
830.55	2.1587
831.41	2.1586
832.26	2.1586
833.11	2.1585
833.96	2.1585
834.81	2.1584
835.66	2.1584
836.51	2.1583
837.36	2.1583
838.21	2.1582
839.06	2.1582
839.91	2.1581
840.75	2.1581
841.6	2.158
842.45	2.1579
843.29	2.1579
844.14	2.1578
844.99	2.1578
845.83	2.1577

846.68	2.1577
847.52	2.1576
848.37	2.1576
849.21	2.1575
850.05	2.1575
850.9	2.1574
851.74	2.1574
852.58	2.1573
853.42	2.1573
854.27	2.1572
855.11	2.1572
855.95	2.1571
856.79	2.1571
857.63	2.157
858.47	2.157
859.31	2.1569
860.15	2.1569
860.98	2.1568
861.82	2.1568
862.66	2.1568
863.5	2.1567
864.33	2.1567
865.17	2.1566
866.01	2.1566
866.84	2.1565
867.68	2.1565
868.51	2.1564
869.35	2.1564
870.18	2.1563
871.01	2.1563
871.85	2.1562
872.68	2.1562
873.51	2.1562
874.35	2.1561
875.18	2.1561
876.01	2.156
876.84	2.156
877.67	2.1559
878.5	2.1559
879.33	2.1558
880.16	2.1558
880.99	2.1557
881.82	2.1557
882.65	2.1557
883.47	2.1556
884.3	2.1556
885.13	2.1555
885.95	2.1555
886.78	2.1554
887.61	2.1554
888.43	2.1554
889.26	2.1553
890.08	2.1553
890.91	2.1552
891.73	2.1552
892.55	2.1552
893.38	2.1551
894.2	2.1551
895.02	2.155
895.84	2.155



896.67	2.1549
897.49	2.1549
898.31	2.1549
899.13	2.1548
899.95	2.1548
900.77	2.1547
901.59	2.1547
902.41	2.1547
903.22	2.1546
904.04	2.1546
904.86	2.1545
905.68	2.1545
906.49	2.1545
907.31	2.1544
908.13	2.1544
908.94	2.1543
909.76	2.1543
910.57	2.1543
911.39	2.1542
912.2	2.1542
913.01	2.1542
913.83	2.1541
914.64	2.1541
915.45	2.154
916.27	2.154
917.08	2.154
917.89	2.1539
918.7	2.1539
919.51	2.1539
920.32	2.1538
921.13	2.1538
921.94	2.1537
922.75	2.1537
923.56	2.1537
924.37	2.1536
925.17	2.1536
925.98	2.1536
926.79	2.1535
927.59	2.1535
928.4	2.1535
929.21	2.1534
930.01	2.1534
930.82	2.1533
931.62	2.1533
932.43	2.1533
933.23	2.1532
934.03	2.1532
934.84	2.1532
935.64	2.1531
936.44	2.1531
937.24	2.1531
938.05	2.153
938.85	2.153
939.65	2.153
940.45	2.1529
941.25	2.1529
942.05	2.1529
942.85	2.1528
943.65	2.1528
944.44	2.1528

945.24	2.1527
946.04	2.1527
946.84	2.1527
947.63	2.1526
948.43	2.1526
949.23	2.1526
950.02	2.1525
950.82	2.1525
951.61	2.1525
952.41	2.1524
953.2	2.1524
953.99	2.1524
954.79	2.1523
955.58	2.1523
956.37	2.1523
957.17	2.1522
957.96	2.1522
958.75	2.1522
959.54	2.1521
960.33	2.1521
961.12	2.1521
961.91	2.152
962.7	2.152
963.49	2.152
964.28	2.152
965.07	2.1519
965.85	2.1519
966.64	2.1519
967.43	2.1518
968.21	2.1518
969	2.1518
969.79	2.1517
970.57	2.1517
971.36	2.1517
972.14	2.1516
972.93	2.1516
973.71	2.1516
974.49	2.1516
975.28	2.1515
976.06	2.1515
976.84	2.1515
977.62	2.1514
978.41	2.1514
979.19	2.1514
979.97	2.1514
980.75	2.1513
981.53	2.1513
982.31	2.1513
983.09	2.1512
983.87	2.1512
984.64	2.1512
985.42	2.1512
986.2	2.1511
986.98	2.1511
987.75	2.1511
988.53	2.151
989.31	2.151
990.08	2.151
990.86	2.151
991.63	2.1509

992.41	2.1509
993.18	2.1509
993.95	2.1508
994.73	2.1508
995.5	2.1508
996.27	2.1508
997.05	2.1507
997.82	2.1507
998.59	2.1507
999.36	2.1507
1000.13	2.1506
1000.9	2.1506
1001.67	2.1506
1002.44	2.1505
1003.21	2.1505
1003.98	2.1505
1004.75	2.1505
1005.51	2.1504
1006.28	2.1504
1007.05	2.1504
1007.81	2.1504
1008.58	2.1503
1009.35	2.1503
1010.11	2.1503
1010.88	2.1503
1011.64	2.1502
1012.41	2.1502
1013.17	2.1502
1013.93	2.1502
1014.7	2.1501
1015.46	2.1501
1016.22	2.1501
1016.98	2.1501
1017.75	2.15
1018.51	2.15
1019.27	2.15
1020.03	2.15
1020.79	2.1499
1021.55	2.1499
1022.31	2.1499
1023.07	2.1499
1023.82	2.1498
1024.58	2.1498
1025.34	2.1498
1026.1	2.1498
1026.85	2.1497
1027.61	2.1497
1028.37	2.1497
1029.12	2.1497
1029.88	2.1496
1030.63	2.1496
1031.39	2.1496
1032.14	2.1496
1032.89	2.1495
Wavelength $\lambda$ (nm)	Extinction coefficient $k$ (-)
219.5	1.2576
220.51	1.2266
221.53	1.1945
222.54	1.1615

223.55	1.128
224.56	1.0942
225.57	1.0603
226.59	1.0265
227.6	.9929
228.61	.9598
229.62	.9273
230.63	.8955
231.63	.8644
232.64	.8341
233.65	.8047
234.66	.7763
235.67	.7488
236.68	.7222
237.68	.6967
238.69	.6721
239.7	.6484
240.7	.6257
241.71	.6039
242.71	.583
243.72	.5629
244.72	.5437
245.73	.5253
246.73	.5077
247.73	.4908
248.74	.4746
249.74	.4591
250.74	.4443
251.75	.4301
252.75	.4164
253.75	.4034
254.75	.3909
255.75	.3789
256.75	.3674
257.75	.3564
258.75	.3458
259.75	.3356
260.75	.3259
261.75	.3165
262.75	.3075
263.75	.2989
264.75	.2905
265.74	.2825
266.74	.2748
267.74	.2674
268.73	.2603
269.73	.2534
270.73	.2468
271.72	.2404
272.72	.2343
273.71	.2283
274.71	.2226
275.7	.2171
276.69	.2117
277.69	.2066
278.68	.2016
279.67	.1967
280.66	.1921
281.66	.1876
282.65	.1832

283.64	.179
284.63	.1749
285.62	.1709
286.61	.1671
287.6	.1633
288.59	.1597
289.58	.1562
290.57	.1528
291.56	.1495
292.55	.1463
293.54	.1432
294.52	.1402
295.51	.1373
296.5	.1344
297.48	.1317
298.47	.129
299.46	.1263
300.44	.1238
301.43	.1213
302.41	.1189
303.4	.1165
304.38	.1143
305.36	.112
306.35	.1099
307.33	.1077
308.31	.1057
309.3	.1037
310.28	.1017
311.26	.0998
312.24	.0979
313.22	.0961
314.2	.0943
315.18	.0926
316.16	.0909
317.14	.0892
318.12	.0876
319.1	.086
320.08	.0845
321.06	.083
322.04	.0815
323.02	.0801
323.99	.0787
324.97	.0773
325.95	.076
326.92	.0746
327.9	.0733
328.87	.0721
329.85	.0709
330.82	.0696
331.8	.0685
332.77	.0673
333.75	.0662
334.72	.0651
335.69	.064
336.67	.0629
337.64	.0619
338.61	.0608
339.58	.0598
340.56	.0588
341.53	.0579

342.5	.0569
343.47	.056
344.44	.0551
345.41	.0542
346.38	.0533
347.35	.0525
348.32	.0516
349.28	.0508
350.25	.05
351.22	.0492
352.19	.0484
353.16	.0476
354.12	.0469
355.09	.0462
356.05	.0454
357.02	.0447
357.99	.044
358.95	.0433
359.92	.0426
360.88	.042
361.84	.0413
362.81	.0407
363.77	.0401
364.73	.0394
365.7	.0388
366.66	.0382
367.62	.0376
368.58	.0371
369.54	.0365
370.51	.0359
371.47	.0354
372.43	.0348
373.39	.0343
374.35	.0338
375.3	.0333
376.26	.0327
377.22	.0323
378.18	.0318
379.14	.0313
380.1	.0308
381.05	.0303
382.01	.0299
382.97	.0294
383.92	.029
384.88	.0285
385.83	.0281
386.79	.0277
387.74	.0272
388.7	.0268
389.65	.0264
390.61	.026
391.56	.0256
392.51	.0252
393.47	.0249
394.42	.0245
395.37	.0241
396.32	.0237
397.27	.0234
398.22	.023
399.18	.0227

400.13	.0223
401.08	.022
402.03	.0217
402.97	.0213
403.92	.021
404.87	.0207
405.82	.0204
406.77	.0201
407.72	.0198
408.66	.0194
409.61	.0192
410.56	.0189
411.5	.0186
412.45	.0183
413.39	.018
414.34	.0177
415.29	.0175
416.23	.0172
417.17	.0169
418.12	.0167
419.06	.0164
420	.0161
420.95	.0159
421.89	.0156
422.83	.0154
423.77	.0152
424.72	.0149
425.66	.0147
426.6	.0145
427.54	.0142
428.48	.014
429.42	.0138
430.36	.0136
431.3	.0133
432.24	.0131
433.17	.0129
434.11	.0127
435.05	.0125
435.99	.0123
436.92	.0121
437.86	.0119
438.8	.0117
439.73	.0115
440.67	.0113
441.6	.0112
442.54	.011
443.47	.0108
444.41	.0106
445.34	.0104
446.28	.0103
447.21	.0101
448.14	.0099
449.07	.0098
450.01	.0096
450.94	.0094
451.87	.0093
452.8	.0091
453.73	.009
454.66	.0088
455.59	.0087

456.52	.0085
457.45	.0084
458.38	.0082
459.31	.0081
460.24	.0079
461.17	.0078
462.09	.0077
463.02	.0075
463.95	.0074
464.88	.0072
465.8	.0071
466.73	.007
467.65	.0069
468.58	.0067
469.5	.0066
470.43	.0065
471.35	.0064
472.28	.0063
473.2	.0061
474.13	.006
475.05	.0059
475.97	.0058
476.89	.0057
477.82	.0056
478.74	.0055
479.66	.0054
480.58	.0053
481.5	.0052
482.42	.0051
483.34	.005
484.26	.0049
485.18	.0048
486.1	.0047
487.02	.0046
487.93	.0045
488.85	.0044
489.77	.0043
490.69	.0042
491.6	.0041
492.52	.004
493.44	.0039
494.35	.0039
495.27	.0038
496.18	.0037
497.1	.0036
498.01	.0035
498.93	.0035
499.84	.0034
500.75	.0033
501.67	.0032
502.58	.0032
503.49	.0031
504.4	.003
505.32	.0029
506.23	.0029
507.14	.0028
508.05	.0027
508.96	.0027
509.87	.0026
510.78	.0025



511.69	.0025
512.6	.0024
513.51	.0024
514.42	.0023
515.32	.0022
516.23	.0022
517.14	.0021
518.05	.0021
518.95	.002
519.86	.002
520.76	.0019
521.67	.0019
522.57	.0018
523.48	.0018
524.38	.0017
525.29	.0017
526.19	.0016
527.1	.0016
528	.0015
528.9	.0015
529.8	.0014
530.71	.0014
531.61	.0013
532.51	.0013
533.41	.0013
534.31	.0012
535.21	.0012
536.11	.0011
537.01	.0011
537.91	.0011
538.81	.001
539.71	.001
540.61	.0009
541.51	.0009
542.4	.0009
543.3	.0008
544.2	.0008
545.1	.0008
545.99	.0008
546.89	.0007
547.78	.0007
548.68	.0007
549.57	.0006
550.47	.0006
551.36	.0006
552.26	.0006
553.15	.0005
554.04	.0005
554.94	.0005
555.83	.0005
556.72	.0004
557.61	.0004
558.51	.0004
559.4	.0004
560.29	.0003
561.18	.0003
562.07	.0003
562.96	.0003
563.85	.0003
564.74	.0002

565.63	.0002
566.51	.0002
567.4	.0002
568.29	.0002
569.18	.0002
570.06	.0002
570.95	.0001
571.84	.0001
572.72	.0001
573.61	.0001
574.5	.0001
575.38	.0001
576.26	.0001
577.15	.0001
578.03	0
578.92	0
579.8	0
580.68	0
581.57	0
582.45	0
583.33	0
584.21	0
585.09	0
585.97	0
586.86	0
587.74	0
588.62	0
589.5	0
590.37	0
591.25	0
592.13	0
593.01	0
593.89	0
594.77	0
595.64	0
596.52	0
597.4	0
598.27	0
598.85	0
599.76	0
600.67	0
601.59	0
602.5	0
603.41	0
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612.05	0
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620.65	0
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622.46	0
623.36	0
624.27	0
625.17	0
626.08	0
626.98	0
628.31	0
629.22	0
630.12	0
631.02	0
631.92	0
632.82	0
633.72	0
634.62	0
635.52	0
636.42	0
637.32	0
638.65	0
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642.24	0
643.14	0
644.03	0
644.93	0
645.82	0
646.72	0
647.61	0
648.94	0
649.83	0
650.72	0
651.62	0
652.51	0
653.4	0
654.3	0
655.19	0
656.08	0
656.97	0
657.86	0
658.75	0
660.07	0
660.96	0
661.84	0
662.73	0
663.62	0
664.51	0
665.4	0
666.28	0
667.17	0
668.06	0
668.94	0
670.25	0
671.14	0
672.02	0
672.91	0
673.79	0
674.67	0

675.56	0
676.44	0
677.32	0
678.21	0
679.09	0
680.39	0
681.27	0
682.15	0
683.03	0
683.91	0
684.79	0
685.67	0
686.55	0
687.43	0
688.31	0
689.18	0
690.48	0
690.98	0
691.9	0
692.81	0
693.73	0
694.64	0
695.55	0
696.46	0
697.38	0
698.29	0
699.2	0
700.11	0
701.02	0
701.93	0
702.84	0
703.75	0
704.66	0
705.56	0
706.47	0
707.38	0
708.29	0
709.19	0
710.1	0
711	0
711.91	0
712.82	0
713.72	0
714.62	0
715.53	0
716.43	0
717.34	0
718.24	0
719.14	0
720.04	0
720.94	0
721.85	0
722.75	0
723.65	0
724.55	0
725.45	0
726.35	0
727.24	0
728.14	0
729.04	0

729.94	0
730.84	0
731.73	0
732.63	0
733.52	0
734.42	0
735.32	0
736.21	0
737.11	0
738	0
738.89	0
739.79	0
740.68	0
741.57	0
742.46	0
743.36	0
744.25	0
745.14	0
746.03	0
746.92	0
747.81	0
748.7	0
749.59	0
750.48	0
751.36	0
752.25	0
753.14	0
754.03	0
754.91	0
755.8	0
756.69	0
757.57	0
758.46	0
759.34	0
760.23	0
761.11	0
761.99	0
762.88	0
763.76	0
764.64	0
765.52	0
766.4	0
767.29	0
768.17	0
769.05	0
769.93	0
770.81	0
771.69	0
772.56	0
773.44	0
774.32	0
775.2	0
776.08	0
776.95	0
777.83	0
778.71	0
779.58	0
780.46	0
781.33	0
782.21	0

783.08	0
783.95	0
784.83	0
785.7	0
786.57	0
787.44	0
788.32	0
789.19	0
790.06	0
790.93	0
791.8	0
792.67	0
793.54	0
794.41	0
795.28	0
796.14	0
797.01	0
797.88	0
798.75	0
799.61	0
800.48	0
801.35	0
802.21	0
803.08	0
803.94	0
804.81	0
805.67	0
806.53	0
807.4	0
808.26	0
809.12	0
809.98	0
810.84	0
811.71	0
812.57	0
813.43	0
814.29	0
815.15	0
816.01	0
816.86	0
817.72	0
818.58	0
819.44	0
820.3	0
821.15	0
822.01	0
822.87	0
823.72	0
824.58	0
825.43	0
826.29	0
827.14	0
827.99	0
828.85	0
829.7	0
830.55	0
831.41	0
832.26	0
833.11	0
833.96	0

834.81	0
835.66	0
836.51	0
837.36	0
838.21	0
839.06	0
839.91	0
840.75	0
841.6	0
842.45	0
843.29	0
844.14	0
844.99	0
845.83	0
846.68	0
847.52	0
848.37	0
849.21	0
850.05	0
850.9	0
851.74	0
852.58	0
853.42	0
854.27	0
855.11	0
855.95	0
856.79	0
857.63	0
858.47	0
859.31	0
860.15	0
860.98	0
861.82	0
862.66	0
863.5	0
864.33	0
865.17	0
866.01	0
866.84	0
867.68	0
868.51	0
869.35	0
870.18	0
871.01	0
871.85	0
872.68	0
873.51	0
874.35	0
875.18	0
876.01	0
876.84	0
877.67	0
878.5	0
879.33	0
880.16	0
880.99	0
881.82	0
882.65	0
883.47	0
884.3	0

885.13	0
885.95	0
886.78	0
887.61	0
888.43	0
889.26	0
890.08	0
890.91	0
891.73	0
892.55	0
893.38	0
894.2	0
895.02	0
895.84	0
896.67	0
897.49	0
898.31	0
899.13	0
899.95	0
900.77	0
901.59	0
902.41	0
903.22	0
904.04	0
904.86	0
905.68	0
906.49	0
907.31	0
908.13	0
908.94	0
909.76	0
910.57	0
911.39	0
912.2	0
913.01	0
913.83	0
914.64	0
915.45	0
916.27	0
917.08	0
917.89	0
918.7	0
919.51	0
920.32	0
921.13	0
921.94	0
922.75	0
923.56	0
924.37	0
925.17	0
925.98	0
926.79	0
927.59	0
928.4	0
929.21	0
930.01	0
930.82	0
931.62	0
932.43	0
933.23	0



934.03	0
934.84	0
935.64	0
936.44	0
937.24	0
938.05	0
938.85	0
939.65	0
940.45	0
941.25	0
942.05	0
942.85	0
943.65	0
944.44	0
945.24	0
946.04	0
946.84	0
947.63	0
948.43	0
949.23	0
950.02	0
950.82	0
951.61	0
952.41	0
953.2	0
953.99	0
954.79	0
955.58	0
956.37	0
957.17	0
957.96	0
958.75	0
959.54	0
960.33	0
961.12	0
961.91	0
962.7	0
963.49	0
964.28	0
965.07	0
965.85	0
966.64	0
967.43	0
968.21	0
969	0
969.79	0
970.57	0
971.36	0
972.14	0
972.93	0
973.71	0
974.49	0
975.28	0
976.06	0
976.84	0
977.62	0
978.41	0
979.19	0
979.97	0
980.75	0

981.53	0
982.31	0
983.09	0
983.87	0
984.64	0
985.42	0
986.2	0
986.98	0
987.75	0
988.53	0
989.31	0
990.08	0
990.86	0
991.63	0
992.41	0
993.18	0
993.95	0
994.73	0
995.5	0
996.27	0
997.05	0
997.82	0
998.59	0
999.36	0
1000.13	0
1000.9	0
1001.67	0
1002.44	0
1003.21	0
1003.98	0
1004.75	0
1005.51	0
1006.28	0
1007.05	0
1007.81	0
1008.58	0
1009.35	0
1010.11	0
1010.88	0
1011.64	0
1012.41	0
1013.17	0
1013.93	0
1014.7	0
1015.46	0
1016.22	0
1016.98	0
1017.75	0
1018.51	0
1019.27	0
1020.03	0
1020.79	0
1021.55	0
1022.31	0
1023.07	0
1023.82	0
1024.58	0
1025.34	0
1026.1	0
1026.85	0

1027.61	0
1028.37	0
1029.12	0
1029.88	0
1030.63	0
1031.39	0
1032.14	0
1032.89	0

# **SiC (Silicon carbide)**

Wavelength $\lambda$ (nm)	Refractive index $n$ (-)
250	3.132
270	3.015
290	2.974
310	2.933
330	2.896
350	2.844
370	2.807
390	2.778
410	2.754
430	2.735
450	2.72
470	2.705
490	2.692
510	2.681
530	2.671
550	2.663
570	2.655
590	2.647
610	2.641
630	2.636
650	2.631
670	2.626
690	2.622
710	2.618
730	2.614
750	2.61
770	2.607
790	2.603
810	2.6
830	2.598
850	2.595
870	2.593
890	2.59
910	2.588
930	2.587
950	2.585
970	2.584
990	2.582
1010	2.581
1030	2.58
1050	2.579
1070	2.578
1090	2.577
1110	2.576
1130	2.576
1150	2.575
1170	2.575
1190	2.574
1210	2.574

1230	2.573
1250	2.573

Wavelength $\lambda$ (nm)	Extinction coefficient $k$ (-)
250.00	0.205
270.00	0.046
290.00	0.01
310.00	0.009
330.00	0.006
350.00	0.002
370.00	0.001
390.00	0
410.00	0
430.00	0
450.00	0
470.00	0
490.00	0
510.00	0
530.00	0
550.00	0
570.00	0
590.00	0
610.00	0
630.00	0
650.00	0
670.00	0
690.00	0
710.00	0
730.00	0
750.00	0
770.00	0
790.00	0
810.00	0
830.00	0
850.00	0
870.00	0
890.00	0
910.00	0
930.00	0
950.00	0
970.00	0
990.00	0
1010.00	0
1030.00	0
1050.00	0
1070.00	0
1090.00	0
1110.00	0
1130.00	0
1150.00	0
1170.00	0
1190.00	0
1210.00	0
1230.00	0
1250.00	0

#### SiO (Silicon monoxide)

Wavelength $\lambda$ (nm)	Refractive index $n$ (-)
206.63	1.829

215.62	1.871
225.42	1.914
236.15	1.957
247.96	2.001
258.29	2.034
269.52	2.066
281.77	2.094
295.19	2.119
309.95	2.141
326.26	2.157
344.39	2.162
364.65	2.16
387.44	2.144
413.27	2.116
442.79	2.085
476.85	2.053
516.58	2.021
563.55	1.994
619.9	1.969
688.78	1.948
774.87	1.929
885.57	1.913
999.84	1.87
2000	1.84

Wavelength $\lambda$ (nm)	Extinction coefficient $k$ (-)
206.63	0.7084
215.62	0.689
225.42	0.6663
236.15	0.6383
247.96	0.6052
258.29	0.5723
269.52	0.5364
281.77	0.4948
295.19	0.4499
309.95	0.4006
326.26	0.3453
344.39	0.2872
364.65	0.2287
387.44	0.1706
413.27	0.1211
442.79	0.08374
476.85	0.05544
516.58	0.03533
563.55	0.02153
619.90	0.01175
688.78	0.00523
774.87	0.00151
885.57	0
999.84	0
2000.00	0

#### **SiO<sub>2</sub> (silicon dioxide)**

Wavelength $\lambda$ (nm)	Refractive index $n$ (-)
206.6	1.543
226.7	1.52276
248.3	1.50841
265.2	1.50004
280.3	1.49404

302.2	1.48719
330.3	1.48053
361.1	1.47512
404.7	1.46961
435.8	1.46669
467.8	1.46429
508.6	1.46187
546.1	1.46008
577	1.45885
589.3	1.45841
643.8	1.45671
667.8	1.45608
706.5	1.45515
852.1	1.45248
894.4	1.45185
1014	1.45025
1128.6	1.44888
1362.2	1.44621
1469.5	1.44497
1660.6	1.44267

Wavelength $\lambda$ (nm)	Extinction coefficient $k$ (-)
361.1	0
404.7	0
435.8	0
467.8	0
508.6	0
546.1	0
577	0
589.3	0
643.8	0
667.8	0
706.5	0
852.1	0
894.4	0
1014	0
1128.6	0
1362.2	0
1469.5	0
1660.6	0

### SPR2FX13

Wavelength $\lambda$ (nm)	Refractive index $n$ (-)
220	1.946741006
240	1.89103692
260	1.847674069
280	1.813259516
300	1.785490802
320	1.762760949
340	1.743920823
360	1.728131093
380	1.71476716
400	1.703356465
420	1.693536145
440	1.685023844
460	1.677597189
480	1.67107913
500	1.665327288
520	1.660226116

540	1.655681054
560	1.651614115
580	1.647960518
600	1.644666092
620	1.641685258
640	1.638979444
660	1.636515831
680	1.634266353
700	1.632206895
720	1.630316642
740	1.628577555
760	1.626973934
780	1.625492068
800	1.624119935
820	1.622846964
840	1.621663824
860	1.620562258
880	1.619534935
900	1.618575332
920	1.617677624
940	1.616836601
960	1.616047589
980	1.615306386
1000	1.614609206
1020	1.61395263
1040	1.613333566
1060	1.61274921

#### SPR2FX13JL

Wavelength $\lambda$ (nm)	Refractive index $n$ (-)
"Material"	6
220	1.959982436
240	1.901868121
260	1.856597978
280	1.820650389
300	1.791632222
320	1.767871358
340	1.748171009
360	1.731656391
380	1.717676129
400	1.705737148
420	1.695460671
440	1.686551846
460	1.678778388
480	1.671955299
500	1.665933776
520	1.660593032
540	1.6558342
560	1.651575726
580	1.647749857
600	1.644299931
620	1.641178263
640	1.638344499
660	1.635764297
680	1.633408288
700	1.631251233
720	1.629271349
740	1.627449752
760	1.625770011
780	1.62421777

800	1.622780447
820	1.621446971
840	1.620207576
860	1.619053615
880	1.617977414
900	1.61697214
920	1.616031695
940	1.615150623
960	1.614324029
980	1.613547513
1000	1.612817111
1020	1.612129242
1040	1.611480667
1060	1.610868449

### SPR2FX13JM

Wavelength $\lambda$ (nm)	Refractive index $n$ (-)
220	1.932444973
240	1.878955867
260	1.83728857
280	1.804201813
300	1.777492963
320	1.755622999
340	1.73749039
360	1.722289979
380	1.709422233
400	1.69843332
420	1.688974609
440	1.680774712
460	1.67361983
480	1.66733969
500	1.661797328
520	1.656881571
540	1.652501419
560	1.64858181
580	1.64506038
600	1.641884977
620	1.639011712
640	1.636403439
660	1.634028552
680	1.631860018
700	1.629874606
720	1.628052267
740	1.62637562
760	1.624829541
780	1.623400816
800	1.622077864
820	1.620850496
840	1.619709723
860	1.618647585
880	1.61765702
900	1.616731738
920	1.615866126
940	1.615055163
960	1.614294343
980	1.613579616
1000	1.612907333
1020	1.612274199
1040	1.611677232



1060 1.611113729

### SPR3000

Wavelength $\lambda$ (nm)	Refractive index $n$ (-)
220	1.935062281
240	1.880443376
260	1.837873984
280	1.804057212
300	1.776750247
320	1.754384672
340	1.735837153
360	1.72028614
380	1.707119611
400	1.695874102
420	1.686193463
440	1.67780038
460	1.670476331
480	1.664047242
500	1.658373072
520	1.653340127
540	1.648855333
560	1.644841905
580	1.641236045
600	1.63798439
620	1.635042035
640	1.632370966
660	1.629938836
680	1.627717979
700	1.625684619
720	1.623818231
740	1.622101025
760	1.620517517
780	1.619054182
800	1.617699163
820	1.616442027
840	1.615273571
860	1.614185647
880	1.613171021
900	1.612223254
920	1.6113366
940	1.610505914
960	1.609726585
980	1.608994465
1000	1.608305817
1020	1.607657266
1040	1.607045759
1060	1.606468527

### SPR3500

Wavelength $\lambda$ (nm)	Refractive index $n$ (-)
220	1.923219702
240	1.870458992
260	1.829378091
280	1.796768785
300	1.770452963
320	1.748909876
340	1.731051731
360	1.716083806
380	1.703414581

400	1.692596445
420	1.683285646
440	1.675214661
460	1.668172783
480	1.661992229
500	1.656538064
520	1.651700776
540	1.647390735
560	1.643534018
580	1.640069217
600	1.636944977
620	1.634118089
640	1.631551984
660	1.629215548
680	1.627082169
700	1.625128984
720	1.623336256
740	1.621686882
760	1.620165974
780	1.61876053
800	1.617459153
820	1.616251816
840	1.615129673
860	1.614084892
880	1.613110524
900	1.61220038
920	1.611348937
940	1.610551254
960	1.6098029
980	1.609099888
1000	1.608438629
1020	1.607815881
1040	1.60722871
1060	1.606674457

#### SPR500A

Wavelength $\lambda$ (nm)	Refractive index $n$ (-)
220	1.857725801
240	1.819920064
260	1.790421465
280	1.766967369
300	1.748014938
320	1.732483253
340	1.719596981
360	1.708788394
380	1.69963413
400	1.69181332
420	1.685079218
440	1.679239577
460	1.674142829
480	1.669668181
500	1.665718416
520	1.662214581
540	1.659092022
560	1.656297387
580	1.653786333
600	1.651521767
620	1.649472464
640	1.64761199
660	1.645917847

680	1.644370789
700	1.642954273
720	1.64165402
740	1.640457649
760	1.639354384
780	1.638334811
800	1.637390676
820	1.636514718
840	1.635700529
860	1.634942436
880	1.634235402
900	1.633574944
920	1.63295706
940	1.632378168
960	1.631835056
980	1.631324834
1000	1.630844901
1020	1.630392906
1040	1.629966721
1060	1.62956442

### SPR700

Wavelength $\lambda$ (nm)	Refractive index $n$ (-)
220	1.907767693
240	1.859228289
260	1.821492343
280	1.791574391
300	1.767453827
320	1.747723355
340	1.731378346
360	1.717686041
380	1.706101786
400	1.696213906
420	1.687706556
440	1.680334138
460	1.673903348
480	1.668260362
500	1.663281536
520	1.65886657
540	1.654933411
560	1.651414407
580	1.64825338
600	1.645403364
620	1.642824853
640	1.640484419
660	1.638353626
680	1.636408162
700	1.634627139
720	1.63299253
740	1.631488716
760	1.630102103
780	1.62882082
800	1.627634463
820	1.62653388
840	1.625510997
860	1.624558667
880	1.623670548
900	1.622840994
920	1.622064966
940	1.621337956

960	1.620655921
980	1.620015226
1000	1.619412596
1020	1.618845074
1040	1.618309985
1060	1.617804904

### SPR850

Wavelength $\lambda$ (nm)	Refractive index $n$ (-)
220	2.501473977
240	2.253174576
260	2.087820472
280	1.973981362
300	1.893339506
320	1.834781311
340	1.79132578
360	1.758452865
380	1.733156748
400	1.713390625
420	1.697730886
440	1.685168312
460	1.674975005
480	1.666617682
500	1.6597
520	1.653923506
540	1.649060725
560	1.644936335
580	1.641413809
600	1.638385802
620	1.635767157
640	1.63348975
660	1.631498658
680	1.629749276
700	1.628205123
720	1.626836174
740	1.625617565
760	1.624528581
780	1.623551878
800	1.622672852
820	1.621879147
840	1.621160264
860	1.620507236
880	1.619912379
900	1.619369075
920	1.618871607
940	1.618415015
960	1.617994985
980	1.617607748
1000	1.61725
1020	1.616918841
1040	1.616611713
1060	1.616326356

### SPR900

Wavelength $\lambda$ (nm)	Refractive index $n$ (-)
220	1.907767693
240	1.859228289
260	1.821492343
280	1.791574391

300	1.767453827
320	1.747723355
340	1.731378346
360	1.717686041
380	1.706101786
400	1.696213906
420	1.687706556
440	1.680334138
460	1.673903348
480	1.668260362
500	1.663281536
520	1.65886657
540	1.654933411
560	1.651414407
580	1.64825338
600	1.645403364
620	1.642824853
640	1.640484419
660	1.638353626
680	1.636408162
700	1.634627139
720	1.63299253
740	1.631488716
760	1.630102103
780	1.62882082
800	1.627634463
820	1.62653388
840	1.625510997
860	1.624558667
880	1.623670548
900	1.622840994
920	1.622064966
940	1.621337956
960	1.620655921
980	1.620015226
1000	1.619412596
1020	1.618845074
1040	1.618309985
1060	1.617804904

#### SPR950

Wavelength $\lambda$ (nm)	Refractive index $n$ (-)
220	2.097209275
240	1.981859375
260	1.901584713
280	1.843802478
300	1.801
320	1.768503357
340	1.743299541
360	1.723385117
380	1.707391142
400	1.694359375
420	1.68360447
440	1.674626716
460	1.667055367
480	1.660611003
500	1.65508
520	1.6502969
540	1.646132009
560	1.642482553

580	1.639266262
600	1.636416667
620	1.633879599
640	1.631610561
660	1.62957273
680	1.627735417
700	1.626072886
720	1.624563422
740	1.623188595
760	1.621932687
780	1.620782221
800	1.619725586
820	1.61875274
840	1.617854956
860	1.617024624
880	1.616255079
900	1.615540466
920	1.614875625
940	1.614255989
960	1.613677511
980	1.613136585
1000	1.61263
1020	1.612154879
1040	1.611708645
1060	1.61128898

#### SPR955CM

Wavelength $\lambda$ (nm)	Refractive index $n$ (-)
220	3.889996469
240	3.168119059
260	2.701950713
280	2.391613411
300	2.179653086
320	2.03169978
340	1.926488695
360	1.850472763
380	1.794797633
400	1.75354375
420	1.722673322
440	1.699382269
460	1.681691669
480	1.668184524
500	1.6578328
520	1.64988172
540	1.643771102
560	1.639081068
580	1.635494054
600	1.632767901
620	1.630716554
640	1.62919608
660	1.628094437
680	1.627323904
700	1.626815452
720	1.626514501
740	1.62637772
760	1.626370576
780	1.626465459
800	1.626640234
820	1.626877112
840	1.627161768

860	1.627482654
880	1.627830452
900	1.628197638
920	1.628578142
940	1.628967072
960	1.629360491
980	1.629755242
1000	1.6301488
1020	1.630539162
1040	1.630924745
1060	1.631304316

# SYSTEM8

Wavelength $\lambda$ (nm)	Refractive index $n$ (-)
220	2.01739121
240	1.928015345
260	1.865240317
280	1.819653066
300	1.785598765
320	1.759537448
340	1.739172911
360	1.722968909
380	1.709869328
400	1.699130469
420	1.69021731
440	1.682737519
460	1.6763984
480	1.670978173
500	1.6663064
520	1.662250412
540	1.658705717
560	1.655589127
580	1.652833757
600	1.65038534
620	1.648199468
640	1.646239523
660	1.644475088
680	1.642880725
700	1.641435027
720	1.640119874
740	1.638919841
760	1.637821733
780	1.636814202
800	1.635887451
820	1.63503298
840	1.634243386
860	1.633512198
880	1.632833737
900	1.632203003
920	1.631615578
940	1.63106755
960	1.630555439
980	1.630076146
1000	1.6296269
1020	1.629205219
1040	1.628808874
1060	1.628435857

**Ta (Tantalum)**

Wavelength $\lambda$ (nm)	Refractive index $n$ (-)
180	1.20774
190	1.316755
200	1.48
210	1.720912
220	2.016951
230	2.321471
240	2.54161
250	2.572579
260	2.480464
270	2.414541
280	2.372254
290	2.351044
300	2.348354
310	2.361625
320	2.388301
330	2.425822
340	2.471636
350	2.52297
360	2.576122
370	2.630314
380	2.68343
390	2.733411
400	2.776369
410	2.805519
420	2.827264
430	2.841735
440	2.848885
450	2.848305
460	2.839252
470	2.823172
480	2.80048
490	2.771415
500	2.737603
510	2.700764
520	2.657433
530	2.6069
540	2.548706
550	2.47794
560	2.391179
570	2.298247
580	2.201368
590	2.102607
600	2.006822
610	1.91713
620	1.830121
630	1.746458
640	1.666745
650	1.591944
660	1.522716
670	1.459061
680	1.401485
690	1.350147
700	1.308842
710	1.277696
720	1.251963
730	1.230646
740	1.212715
750	1.19474



760	1.176222
770	1.159275
780	1.143788
790	1.129663
800	1.117038
810	1.105745
820	1.095448
830	1.085986
840	1.077196
850	1.068523
860	1.06003
870	1.051964
880	1.04432
890	1.037069
900	1.030223
910	1.023604
920	1.017208
930	1.011101
940	1.005343
950	1
960	0.99644
970	0.993438
980	0.990878
990	0.988645
1000	0.986624
1010	0.984698
1020	0.982751
1030	0.980669
1040	0.976805
1050	0.971979
1060	0.966894
1070	0.961601
1080	0.956152
1090	0.950599
1100	0.944993
1110	0.939386
1120	0.933831
1130	0.928819
1140	0.924996
1150	0.921325
1160	0.917773
1170	0.914312
1180	0.910909
1190	0.907535
1200	0.904157
1210	0.900746
1220	0.89727
1230	0.893698
1240	0.89
1250	0.885982
1260	0.881984
1270	0.878062
1280	0.874242
1290	0.870494
1300	0.866816
1310	0.863201
1320	0.859577
1330	0.855398
1340	0.851392
1350	0.847688

1360	0.844412
1370	0.841691
1380	0.839975
1390	0.84031
1400	0.841317
1410	0.842869
1420	0.844837
1430	0.847093
1440	0.849509
1450	0.850901
1460	0.852037
1470	0.853233
1480	0.854536
1490	0.855996
1500	0.857661
1510	0.859581
1520	0.862505
1530	0.865905
1540	0.869559
1550	0.87342
1560	0.877442
1570	0.881578
1580	0.885779
1590	0.89
1600	0.893536
1610	0.897043
1620	0.900533
1630	0.904019
1640	0.907515
1650	0.911031
1660	0.914582
1670	0.91818
1680	0.922005
1690	0.926066
1700	0.930183
1710	0.934345
1720	0.93854
1730	0.942755
1740	0.94698
1750	0.9512
1760	0.955406
1770	0.959584
1780	0.963312
1790	0.966957
1800	0.970578
1810	0.974189
1820	0.977805
1830	0.98144
1840	0.985108
1850	0.988823
1860	0.992601
1870	0.996455
1880	1.000428
1890	1.00477
1900	1.009221
1910	1.013784
1920	1.018459
1930	1.023247
1940	1.028149
1950	1.033165

1960	1.038297
1970	1.043546
1980	1.048912
1990	1.054396
2000	1.06
2010	1.066018
2020	1.072153
2030	1.078394
2040	1.084733
2050	1.091159
2060	1.097664
2070	1.104237
2080	1.110869
2090	1.11755
2100	1.12427
2110	1.131021
2120	1.137792
2130	1.144574
2140	1.151275
2150	1.157642
2160	1.163998
2170	1.170342
2180	1.176678
2190	1.183005
2200	1.189327
2210	1.195644
2220	1.201958
2230	1.20827
2240	1.214582
2250	1.220896
2260	1.227212
2270	1.233533
2280	1.23986
2290	1.246195
2300	1.252539
2310	1.258893
2320	1.265259
2330	1.271639
2340	1.278034
2350	1.284446
2360	1.290875
2370	1.297325
2380	1.303795
2390	1.310289
2400	1.316806
2410	1.323349
2420	1.32992
2430	1.336519
2440	1.343149
2450	1.34981
2460	1.356505
2470	1.363234
2480	1.37
Wavelength $\lambda$ (nm)	Extinction coefficient $k$ (-)
180	2.065205
190	2.260065
200	2.45
210	2.598338
220	2.66775

230	2.604213
240	2.400758
250	2.154195
260	2.088274
270	2.052975
280	2.04366
290	2.055692
300	2.084435
310	2.125252
320	2.173506
330	2.224561
340	2.273829
350	2.313705
360	2.323725
370	2.323869
380	2.31562
390	2.300048
400	2.27817
410	2.250694
420	2.219278
430	2.185115
440	2.149456
450	2.114728
460	2.084477
470	2.054883
480	2.025856
490	1.997324
500	1.967574
510	1.934722
520	1.903712
530	1.875862
540	1.852421
550	1.834908
560	1.824749
570	1.822568
580	1.829451
590	1.846289
600	1.877807
610	1.926347
620	1.985327
630	2.053735
640	2.130431
650	2.215719
660	2.308684
670	2.405752
680	2.505086
690	2.605323
700	2.70028
710	2.788593
720	2.875185
730	2.96012
740	3.043608
750	3.12641
760	3.208536
770	3.289673
780	3.369617
790	3.448425
800	3.525918
810	3.602155
820	3.677328

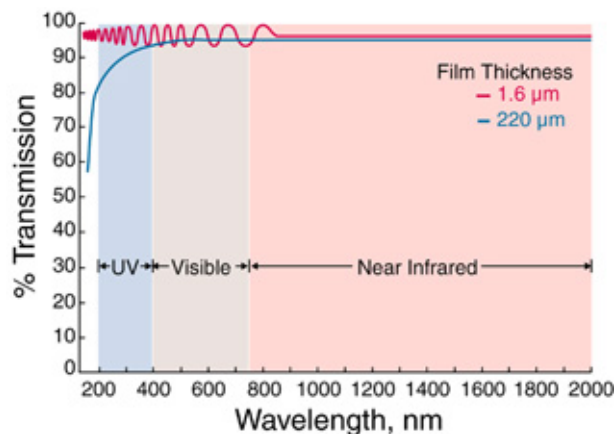
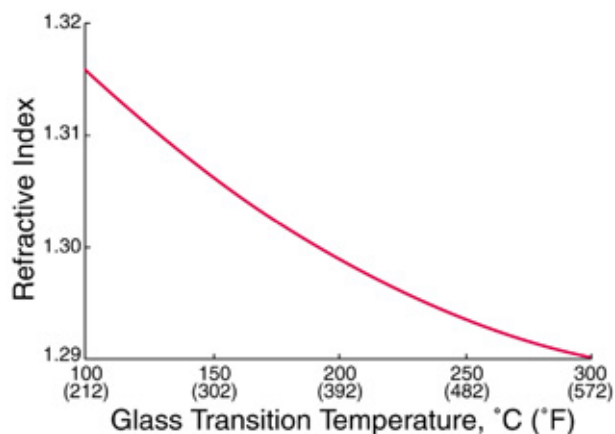
830	3.751492
840	3.824705
850	3.896868
860	3.968127
870	4.038717
880	4.108688
890	4.178371
900	4.247684
910	4.319156
920	4.392921
930	4.468182
940	4.544141
950	4.62
960	4.687176
970	4.752549
980	4.816387
990	4.878958
1000	4.940531
1010	5.001373
1020	5.061754
1030	5.121941
1040	5.185
1050	5.249489
1060	5.31418
1070	5.379036
1080	5.444019
1090	5.50909
1100	5.574213
1110	5.639348
1120	5.704458
1130	5.768796
1140	5.831369
1150	5.893892
1160	5.956459
1170	6.019166
1180	6.082107
1190	6.145379
1200	6.209074
1210	6.273289
1220	6.338118
1230	6.403657
1240	6.47
1250	6.53822
1260	6.606184
1270	6.67312
1280	6.738704
1290	6.803601
1300	6.868038
1310	6.932237
1320	6.996549
1330	7.06216
1340	7.127992
1350	7.194033
1360	7.260278
1370	7.326716
1380	7.393406
1390	7.460529
1400	7.527765
1410	7.595052
1420	7.66233

1430	7.729535
1440	7.796607
1450	7.863115
1460	7.929311
1470	7.995288
1480	8.061046
1490	8.126584
1500	8.191904
1510	8.257007
1520	8.321619
1530	8.385966
1540	8.450153
1550	8.514217
1560	8.578197
1570	8.642129
1580	8.706051
1590	8.77
1600	8.834834
1610	8.899713
1620	8.964601
1630	9.029461
1640	9.094255
1650	9.15895
1660	9.223506
1670	9.287887
1680	9.3516
1690	9.414623
1700	9.477437
1710	9.540071
1720	9.602554
1730	9.664919
1740	9.727194
1750	9.789409
1760	9.851594
1770	9.91378
1780	9.976133
1790	10.03856
1800	10.10106
1810	10.16366
1820	10.22638
1830	10.28924
1840	10.35226
1850	10.41547
1860	10.47888
1870	10.54252
1880	10.60661
1890	10.67284
1900	10.73929
1910	10.8059
1920	10.87258
1930	10.93927
1940	11.00589
1950	11.07236
1960	11.13862
1970	11.20459
1980	11.27019
1990	11.33535
2000	11.4
2010	11.46087
2020	11.52113

2030	11.58081
2040	11.63997
2050	11.69863
2060	11.75685
2070	11.81465
2080	11.87209
2090	11.92919
2100	11.98601
2110	12.04258
2120	12.09894
2130	12.15514
2140	12.21125
2150	12.26744
2160	12.32359
2170	12.37972
2180	12.43587
2190	12.49207
2200	12.54836
2210	12.60477
2220	12.66134
2230	12.71811
2240	12.77509
2250	12.83234
2260	12.88988
2270	12.94775
2280	13.00598
2290	13.06462
2300	13.12368
2310	13.18321
2320	13.24324
2330	13.30381
2340	13.36495
2350	13.42669
2360	13.48907
2370	13.55212
2380	13.61588
2390	13.68039
2400	13.74567
2410	13.81176
2420	13.8787
2430	13.94651
2440	14.01524
2450	14.08492
2460	14.15559
2470	14.22727
2480	14.3

## Teflon

Dupont Corporation: "The high-performance Teflon® AF amorphous fluoropolymer family of products offers a unique combination of superior properties for demanding, high-performance applications."



## Ti (Titanium)

Wavelength $\lambda$ (nm)	Refractive index $n$ (-)
206.63	1.16
210.14	1.18
213.76	1.21
217.51	1.23
221.39	1.24
225.42	1.24
229.59	1.18
233.92	1.35
238.42	1.26
243.1	1.25
247.96	1.24
253.02	1.22
258.29	1.21
263.79	1.18
269.52	1.17
275.51	1.15
281.77	1.13
288.33	1.1
295.19	1.05
302.39	1.04
309.95	1.04
317.9	1.06
326.26	1.11
335.08	1.17
344.39	1.24
354.23	1.3
364.65	1.37
375.7	1.44
387.44	1.5
399.94	1.55
413.27	1.59
427.52	1.63
442.79	1.68
459.19	1.71
476.85	1.75
495.92	1.78
516.58	1.81



539.04	1.86
563.55	1.92
590.38	2.01
619.9	2.11
652.53	2.22
688.78	2.36
729.29	2.54
774.87	2.74
826.53	2.98
885.57	3.17
953.69	3.28
1033.17	3.35
1127.09	3.47
1239.8	3.62

Wavelength $\lambda$ (nm)	Extinction coefficient $k$ (-)
206.63	1.21
210.14	1.22
213.76	1.22
217.51	1.21
221.39	1.21
225.42	1.19
229.59	1.15
233.92	1.21
238.42	1.2
243.10	1.2
247.96	1.21
253.02	1.22
258.29	1.23
263.79	1.25
269.52	1.28
275.51	1.31
281.77	1.33
288.33	1.37
295.19	1.44
302.39	1.53
309.95	1.61
317.90	1.73
326.26	1.83
335.08	1.9
344.39	1.96
354.23	2.01
364.65	2.06
375.70	2.09
387.44	2.12
399.94	2.15
413.27	2.17
427.52	2.21
442.79	2.25
459.19	2.29
476.85	2.34
495.92	2.39
516.58	2.47
539.04	2.56
563.55	2.67
590.38	2.77
619.90	2.88
652.53	2.99
688.78	3.11
729.29	3.23

774.87	3.3
826.53	3.32
885.57	3.28
953.69	3.25
1033.17	3.3
1127.09	3.4
1239.80	3.52

#### **TiN (Titanium nitride)**

Wavelength $\lambda$ (nm)	Refractive index $n$ (-)
250	2.42976
260	2.48595
270	2.46735
280	2.44445
290	2.41597
300	2.3922
310	2.36362
320	2.33198
330	2.30868
340	2.2791
350	2.2502
360	2.21286
370	2.16345
380	2.11559
390	2.06668
400	2.00678
410	1.92486
420	1.82294
430	1.70969
440	1.5978
450	1.48845
460	1.39151
470	1.30869
480	1.23589
490	1.17794
500	1.13308
510	1.08869
520	1.0526
530	1.02392
540	.9975
550	.97193
560	.95359
570	.92849
580	.91411
590	.90375
600	.87995
610	.87039
620	.86266
630	.85795
640	.84818
650	.84533
660	.83805
670	.82799
680	.83332
690	.83654
700	.83099
710	.83961
720	.83674
730	.84234
740	.84172

750	.84815
760	.85508
770	.86263
780	.85505
790	.86922
800	.87239
810	.88956
820	.88248
830	.90089
840	.90986
850	.91135
860	.91248
870	.92696
880	.9386
890	.93796
900	.92169

Wavelength $\lambda$ (nm)	Extinction coefficient $k$ (-)
250.00	1.50788
260.00	1.40654
270.00	1.31625
280.00	1.25898
290.00	1.21784
300.00	1.17733
310.00	1.15391
320.00	1.13275
330.00	1.11245
340.00	1.08929
350.00	1.06255
360.00	1.03597
370.00	1.01573
380.00	0.99914
390.00	0.97984
400.00	0.95555
410.00	0.92983
420.00	0.91516
430.00	0.92606
440.00	0.96309
450.00	1.01311
460.00	1.09293
470.00	1.16947
480.00	1.26014
490.00	1.34971
500.00	1.44033
510.00	1.53012
520.00	1.61716
530.00	1.71145
540.00	1.79846
550.00	1.88527
560.00	1.97303
570.00	2.05191
580.00	2.13518
590.00	2.21513
600.00	2.30056
610.00	2.37818
620.00	2.45375
630.00	2.53882
640.00	2.61162
650.00	2.68866
660.00	2.77202

670.00	2.84814
680.00	2.91858
690.00	2.99869
700.00	3.07618
710.00	3.14639
720.00	3.21804
730.00	3.28737
740.00	3.35051
750.00	3.42523
760.00	3.49341
770.00	3.57155
780.00	3.63646
790.00	3.69387
800.00	3.76286
810.00	3.83744
820.00	3.90615
830.00	3.9749
840.00	4.0315
850.00	4.07859
860.00	4.12929
870.00	4.19353
880.00	4.25453
890.00	4.25381
900.00	4.18083

#### **TiO<sub>2</sub> (Titania or Titanium dioxide)**

Wavelength $\lambda$ (nm)	Refractive index $n$ (-)
210	1.46
241.82	1.853
273.64	2.61
305.45	4.47
337.27	3.9
369.09	3.578
400.91	3.413
432.73	3.054
464.55	2.949
496.36	2.881
528.18	2.829
560	2.792
591.82	2.759
623.64	2.732
655.45	2.712
687.27	2.696
719.09	2.683
750.91	2.67
782.73	2.66
814.55	2.656
846.36	2.649
878.18	2.64
910	2.632
941.82	2.625
973.64	2.621
1005.45	2.617
1037.27	2.613
1069.09	2.61
1100.91	2.61
1132.73	2.602
1164.55	2.601
1196.36	2.6
1228.18	2.599

1260	2.59
Wavelength $\lambda$ (nm)	Extinction coefficient $k$ (-)
210	1.665
241.82	2.343
273.64	2.573
305.45	2.665
337.27	.8
369.09	.12
400.91	.1
432.73	.067
464.55	0
496.36	0
528.18	0
560	0
591.82	0
623.64	0
655.45	0
687.27	0
719.09	0
750.91	0
782.73	0
814.55	0
846.36	0
878.18	0
910	0
941.82	0
973.64	0
1005.45	0
1037.27	0
1069.09	0
1100.91	0
1132.73	0
1164.55	0
1196.36	0
1228.18	0
1260	0

#### UV2HSDUV

Wavelength $\lambda$ (nm)	Refractive index $n$ (-)
220	1.933080623
240	1.821823708
260	1.747251196
280	1.695560923
300	1.658683951
320	1.631708624
340	1.611538959
360	1.596163051
380	1.584237885
400	1.574845313
420	1.567344108
440	1.561277766
460	1.556315599
480	1.552214242
500	1.548792
520	1.54591141
540	1.543467202
560	1.541377851
580	1.539579558

600	1.538021914
620	1.536664727
640	1.535475686
660	1.534428605
680	1.533502111
700	1.532678634
720	1.53194364
740	1.531285029
760	1.530692673
780	1.530158043
800	1.529673926
820	1.529234186
840	1.528833582
860	1.528467617
880	1.528132417
900	1.52782463
920	1.527541346
940	1.527280027
960	1.527038455
980	1.526814684
1000	1.526607
1020	1.52641389
1040	1.526234016
1060	1.526066187

### UV3DUV

Wavelength $\lambda$ (nm)	Refractive index $n$ (-)
220	1.809950277
240	1.738345004
260	1.689566962
280	1.655190077
300	1.630246914
320	1.611687042
340	1.597569976
360	1.586622676
380	1.577986986
400	1.571070313
420	1.565454528
440	1.560838834
460	1.55700302
480	1.553783281
500	1.551056
520	1.548726633
540	1.546721992
560	1.544984775
580	1.543469656
600	1.542140432
620	1.540967928
640	1.539928438
660	1.539002549
680	1.538174248
700	1.537430237
720	1.536759403
740	1.536152402
760	1.535601333
780	1.535099483
800	1.534641113
820	1.534221303
840	1.533835806
860	1.533480949

880	1.533153538
900	1.532850785
920	1.53257025
940	1.532309789
960	1.53206751
980	1.531841741
1000	1.531631
1020	1.531433967
1040	1.531249464
1060	1.53107644

#### UV5DUV

Wavelength $\lambda$ (nm)	Refractive index $n$ (-)
220	1.990477467
240	1.876145718
260	1.799014481
280	1.745190691
300	1.706525926
320	1.678043176
340	1.656594013
360	1.640124806
380	1.627259372
400	1.617053125
420	1.608843664
440	1.602157424
460	1.596649885
480	1.592066399
500	1.588216
520	1.584953568
540	1.582167467
560	1.579770847
580	1.577695434
600	1.575887037
620	1.57430225
640	1.572906019
660	1.571669807
680	1.570570214
700	1.569587922
720	1.568706874
740	1.567913649
760	1.567196959
780	1.56654726
800	1.565956445
820	1.565417589
840	1.564924753
860	1.564472819
880	1.56405736
900	1.563674531
920	1.563320982
940	1.562993779
960	1.562690348
980	1.562408423
1000	1.562146
1020	1.561901306
1040	1.561672764
1060	1.561458969

#### UV6DUV

Wavelength $\lambda$ (nm)	Refractive index $n$ (-)
---------------------------	--------------------------

220	2.201252985
240	2.010264815
260	1.884978991
280	1.800109491
300	1.741018148
320	1.698887561
340	1.668221489
360	1.645490152
380	1.628366426
400	1.61528
420	1.605149053
440	1.597214288
460	1.590933748
480	1.585914663
500	1.5818684
520	1.57858014
540	1.575888125
560	1.573669232
580	1.571828811
600	1.570293426
620	1.569005611
640	1.567920036
660	1.567000675
680	1.566218698
700	1.565550883
720	1.564978406
740	1.564485925
760	1.56406086
780	1.563692852
800	1.56337332
820	1.56309513
840	1.562852322
860	1.562639894
880	1.562453637
900	1.562289991
920	1.562145936
940	1.562018902
960	1.561906694
980	1.561807432
1000	1.5617195
1020	1.561641506
1040	1.561572247
1060	1.561510682

#### W (Tungsten)

Wavelength $\lambda$ (nm)	Refractive index $n$ (-)
206.63	1.7
208.81	1.78
211.03	1.87
213.3	1.98
215.62	2.1
217.99	2.23
220.41	2.37
222.89	2.52
225.42	2.68
228.01	2.83
230.66	2.97
233.37	3.09
236.15	3.2
239	3.29



241.91	3.36
244.9	3.4
247.96	3.4
251.1	3.38
254.32	3.36
257.62	3.34
261.01	3.31
264.49	3.28
268.06	3.25
271.74	3.22
275.51	3.19
279.39	3.15
283.38	3.11
287.49	3.08
291.72	3.04
296.07	3
300.56	2.98
305.18	2.96
309.95	2.95
314.87	2.95
319.95	2.97
325.19	2.99
330.61	3.02
336.22	3.06
342.01	3.11
348.01	3.17
354.23	3.24
360.67	3.34
367.35	3.41
374.28	3.45
381.48	3.45
388.96	3.43
396.74	3.4
404.83	3.38
413.27	3.35
422.06	3.33
431.23	3.32
440.82	3.3
450.84	3.31
461.32	3.31
472.3	3.33
483.82	3.35
495.92	3.38
508.64	3.43
522.02	3.47
536.13	3.5
551.02	3.5
566.77	3.49
583.44	3.52
601.12	3.56
619.9	3.6
639.9	3.66
661.23	3.73
684.03	3.81
708.46	3.85
734.7	3.83
762.95	3.73
793.47	3.59
826.53	3.48
862.47	3.36

901.67	3.24
944.61	3.14
991.84	3.05
1044.04	3
1102.04	3.03
1166.87	3.1
1239.8	3.14

Wavelength $\lambda$ (nm)	Extinction coefficient $k$ (-)
206.63	3.42
208.81	3.48
211.03	3.54
213.30	3.6
215.62	3.64
217.99	3.68
220.41	3.7
222.89	3.7
225.42	3.68
228.01	3.62
230.66	3.55
233.37	3.45
236.15	3.35
239.00	3.24
241.91	3.11
244.90	2.97
247.96	2.85
251.10	2.74
254.32	2.65
257.62	2.58
261.01	2.52
264.49	2.47
268.06	2.43
271.74	2.39
275.51	2.35
279.39	2.33
283.38	2.32
287.49	2.31
291.72	2.32
296.07	2.33
300.56	2.36
305.18	2.39
309.95	2.43
314.87	2.47
319.95	2.52
325.19	2.55
330.61	2.6
336.22	2.63
342.01	2.66
348.01	2.69
354.23	2.7
360.67	2.69
367.35	2.63
374.28	2.56
381.48	2.49
388.96	2.44
396.74	2.42
404.83	2.42
413.27	2.42
422.06	2.43
431.23	2.46

440.82	2.48
450.84	2.53
461.32	2.56
472.30	2.61
483.82	2.63
495.92	2.68
508.64	2.71
522.02	2.72
536.13	2.72
551.02	2.73
566.77	2.76
583.44	2.83
601.12	2.85
619.90	2.89
639.90	2.93
661.23	2.95
684.03	2.92
708.46	2.86
734.70	2.76
762.95	2.69
793.47	2.71
826.53	2.79
862.47	2.87
901.67	3.01
944.61	3.2
991.84	3.39
1044.04	3.69
1102.04	3.94
1166.87	4.16
1239.80	4.32

#### **ZnS (Zinc sulfide)**

Wavelength $\lambda$ (nm)	Refractive index $n$ (-)
206.63	2.239
210.14	2.46511
213.76	2.69178
217.51	2.90052
221.39	3.06873
225.42	3.17865
229.59	3.16355
233.92	3.09635
238.42	3.03988
243.1	3.00326
247.96	2.97044
253.02	2.94168
258.29	2.91461
263.79	2.88257
269.52	2.84569
275.51	2.81009
281.77	2.77909
288.33	2.75229
295.19	2.72518
302.39	2.70169
309.95	2.7029
317.9	2.7561
326.26	2.81698
335.08	2.85074
344.39	2.84586
354.23	2.79056
364.65	2.72151

375.7	2.66168
387.44	2.62867
399.94	2.59898
413.27	2.55855
427.52	2.71913
442.79	2.63766
459.19	2.44836
476.85	2.44093
495.92	2.4253
516.58	2.40922
539.04	2.39492
563.55	2.38004
590.38	2.36978
619.9	2.36147
652.53	2.34558
688.78	2.33728
729.29	2.32771
774.87	2.31886
826.53	2.3106
885.57	2.303
953.69	2.29562
1033.17	2.29009
1127.09	2.28446
1239.8	2.28
1377.56	2.2748
1549.75	2.2706
1771.14	2.2669
2066.33	2.2634

Wavelength $\lambda$ (nm)	Extinction coefficient $k$ (-)
206.63	1.648
210.14	1.76668
213.76	1.7594
217.51	1.6604
221.39	1.49732
225.42	1.30035
229.59	1.10734
233.92	.92477
238.42	.80141
243.1	.73052
247.96	.67942
253.02	.61846
258.29	.5633
263.79	.51965
269.52	.48566
275.51	.46018
281.77	.43821
288.33	.42228
295.19	.42659
302.39	.43958
309.95	.43702
317.9	.39282
326.26	.31902
335.08	.31195
344.39	.28242
354.23	.1005
364.65	.00492
375.7	.039
387.44	.0567
399.94	.04986

413.27	.04036
427.52	.03367
442.79	.03073
459.19	.03018
476.85	.02964
495.92	.02778
516.58	.01684
539.04	.01
563.55	.01
590.38	.0098
619.9	.00823
652.53	.00072
688.78	0
729.29	0
774.87	0
826.53	0
885.57	0
953.69	0
1033.17	0
1127.09	0
1239.8	0
1377.56	0
1549.75	0
1771.14	0
2066.33	0

#### **ZnS-cub (Zinc sulfide of cubic phase)**

Wavelength $\lambda$ (nm)	Refractive index $n$ (-)
206.63	2.24
208.37	2.351
210.14	2.4651
211.93	2.5797
213.76	2.6922
215.62	2.8
217.51	2.9006
219.43	2.9915
221.39	3.0701
223.39	3.1338
225.42	3.18
227.49	3.179
229.59	3.1623
231.74	3.1341
233.92	3.0986
236.15	3.06
238.42	3.0399
240.74	3.021
243.1	3.003
245.5	2.9861
247.96	2.97
250.46	2.9557
253.02	2.9418
255.63	2.9282
258.29	2.9143
261.01	2.9
263.79	2.8823
266.62	2.8642
269.52	2.8458
272.48	2.8277
275.51	2.81
278.61	2.7941

281.77	2.779
285.01	2.765
288.33	2.7519
291.72	2.74
295.19	2.7248
298.75	2.712
302.39	2.7028
306.12	2.6984
309.95	2.7
313.87	2.7254
317.9	2.7551
322.03	2.7861
326.26	2.8154
330.61	2.84
335.08	2.8423
339.67	2.8378
344.39	2.827
349.24	2.8109
354.23	2.79
359.36	2.7632
364.65	2.7336
370.09	2.7024
375.7	2.6708
381.48	2.64
387.44	2.6167
393.59	2.5952
399.94	2.5754
406.49	2.557
413.27	2.54
420.27	2.5229
427.52	2.5071
435.02	2.4927
442.79	2.4799
450.84	2.4687
459.19	2.4593
467.85	2.4502
476.85	2.4414
486.2	2.433
495.92	2.4248
506.04	2.417
516.58	2.4094
527.57	2.4021
539.04	2.395
551.02	2.3882
563.55	2.3816
576.65	2.3753
590.38	2.3692
604.78	2.3633
619.9	2.3576
635.79	2.352
652.53	2.3467
670.16	2.3416
688.78	2.3367
708.46	2.3319
729.29	2.3274
751.39	2.3229
774.87	2.3187
799.87	2.3146
826.53	2.3107
855.03	2.3069

885.57	2.3033
918.37	2.2998
953.69	2.2965
991.84	2.2933
1033.17	2.2903
1078.09	2.2874
1127.09	2.2846
1180.76	2.282
1239.8	2.2795

Wavelength $\lambda$ (nm)	Extinction coefficient $k$ (-)
206.63	1.65
208.37	1.72528
210.14	1.76624
211.93	1.77656
213.76	1.75992
215.62	1.72
217.51	1.66048
219.43	1.58504
221.39	1.49736
223.39	1.40112
225.42	1.3
227.49	1.20248
229.59	1.10624
231.74	1.01376
233.92	0.92752
236.15	0.85
238.42	0.8016
240.74	0.7624
243.10	0.7304
245.50	0.7036
247.96	0.68
250.46	0.64864
253.02	0.61872
255.63	0.59048
258.29	0.56416
261.01	0.54
263.79	0.51984
266.62	0.50192
269.52	0.48608
272.48	0.47216
275.51	0.46
278.61	0.44816
281.77	0.43808
285.01	0.42992
288.33	0.42384
291.72	0.42
295.19	0.42624
298.75	0.43312
302.39	0.43888
306.12	0.44176
309.95	0.44
313.87	0.4216
317.90	0.3976
322.03	0.3688
326.26	0.336
330.61	0.3
335.08	0.25776
339.67	0.21488
344.39	0.17312

349.24	0.13424
354.23	0.1
359.36	0.08368
364.65	0.07264
370.09	0.06576
375.70	0.06192
381.48	0.06
387.44	0.05568
393.59	0.05184
399.94	0.04816
406.49	0.04432
413.27	0.04
420.27	0.02982
427.52	0.01979
435.02	0.01084
442.79	0.00393
450.84	0.00001
459.19	0.00001
467.85	0.00001
476.85	0.00001
486.20	0.00001
495.92	0.00001
506.04	0
516.58	0
527.57	0
539.04	0
551.02	0
563.55	0
576.65	0
590.38	0
604.78	0
619.90	0
635.79	0
652.53	0
670.16	0
688.78	0
708.46	0
729.29	0
751.39	0
774.87	0
799.87	0
826.53	0
855.03	0
885.57	0
918.37	0
953.69	0
991.84	0
1033.17	0
1078.09	0
1127.09	0
1180.76	0
1239.80	0

#### **ZrO<sub>2</sub> (Zirconium dioxide or zirconia)**

Wavelength $\lambda$ (nm)	Refractive index $n$ (-)
250	2.64599
260	2.60254
270	2.56035
280	2.52052
290	2.48387



300	2.45089
310	2.42171
320	2.39616
330	2.37387
340	2.35437
350	2.33718
360	2.32186
370	2.30807
380	2.29561
390	2.28431
400	2.27413
410	2.26501
420	2.25695
430	2.24993
440	2.24391
450	2.23884
460	2.23465
470	2.23125
480	2.22853
490	2.22637
500	2.22467
510	2.2233
520	2.22216
530	2.22117
540	2.22022
550	2.21927
560	2.21825
570	2.21713
580	2.2159
590	2.21454
600	2.21306
610	2.21148
620	2.20982
630	2.20809
640	2.20633
650	2.20455
660	2.20277
670	2.20102
680	2.19929
690	2.1976
700	2.19594
710	2.19433
720	2.19276
730	2.19123
740	2.18975
750	2.1883
760	2.1869
770	2.18553
780	2.18419
790	2.18287
800	2.18156
810	2.18024
820	2.17891
830	2.17756
840	2.1762
850	2.17482

Wavelength $\lambda$ (nm)	Extinction coefficient $k$ (-)
250	0
260	0

270	0
280	0
290	0
300	0
310	0
320	0
330	0
340	0
350	0
360	0
370	0
380	0
390	0
400	0
410	0
420	0
430	0
440	0
450	0
460	0
470	0
480	0
490	0
500	0
510	0
520	0
530	0
540	0
550	0
560	0
570	0
580	0
590	0
600	0
610	0
620	0
630	0
640	0
650	0
660	0
670	0
680	0
690	0
700	0
710	0
720	0
730	0
740	0
750	0
760	0
770	0
780	0
790	0
800	0
810	0
820	0
830	0
840	0
850	0

**Note:** Data provided for educational purposes. Most data after *Filmetrics Corporation* of San Diego, California (2002). Teflon data after *Dupont Corporation* of Wilmington, Delaware (2003).

# Material Science

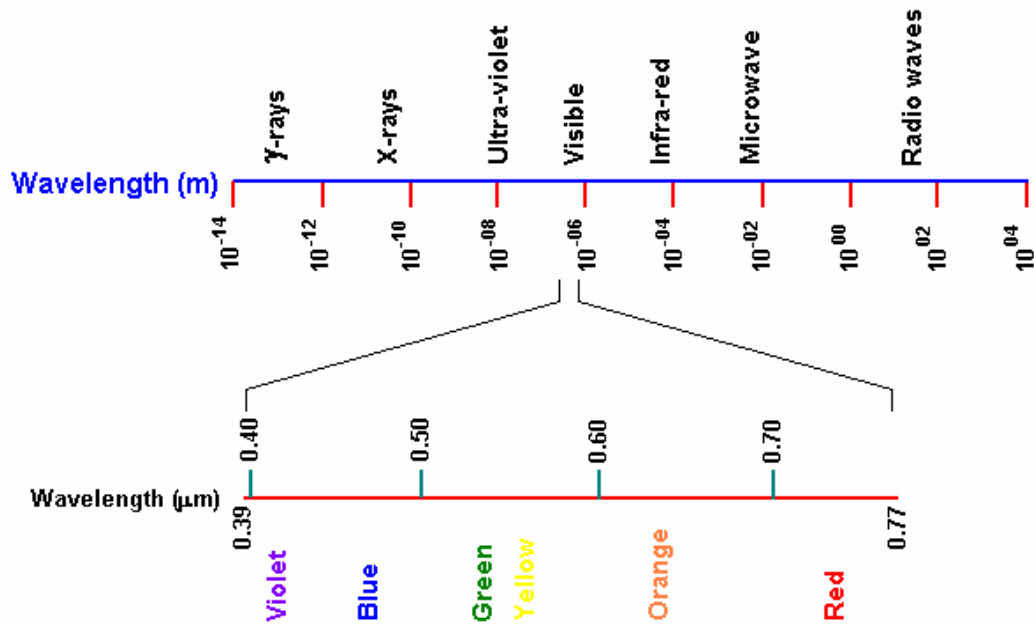
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### Chapter 17. Optical properties

- Optical property of a material is defined as its interaction with electro-magnetic radiation in the visible.
- Electromagnetic spectrum of radiation spans the wide range from  $\gamma$ -rays with wavelength as  $10^{-12}$  m, through x-rays, ultraviolet, visible, infrared, and finally radio waves with wavelengths as long as  $10^5$  m.
- Visible light is one form of electromagnetic radiation with wavelengths ranging from 0.39 to 0.77  $\mu\text{m}$ .
- Light can be considered as having waves and consisting of particles called photons.
- Energy  $E$  of a photon  $E = h\nu = \frac{hc_0}{\lambda}$ 
  - $h$  – Planck's constant ( $6.62 \times 10^{-34}$  J.sec),
  - $\nu$  – frequency,
  - $c_0$  – speed of light in vacuum ( $3 \times 10^8$  m/sec), and
  - $\lambda$  – wavelength.

#### Electro-magnetic radiation



## Material – Light interaction

- Interaction of photons with the electronic or crystal structure of a material leads to a number of phenomena.
- The photons may give their energy to the material (absorption); photons give their energy, but photons of identical energy are immediately emitted by the material (reflection); photons may not interact with the material structure (transmission); or during transmission photons are changes in velocity (refraction).
- At any instance of light interaction with a material, the total intensity of the incident light striking a surface is equal to sum of the absorbed, reflected, and transmitted intensities.

$$I_0 = I_A + I_R + I_T$$

- Where the intensity ' $I$ ' is defined as the number of photons impinging on a surface per unit area per unit time.

## Optical materials

- Materials are classified on the basis of their interaction with visible light into three categories.
- Materials that are capable of transmitting light with relatively little absorption and reflection are called *transparent materials* i.e. we can see through them.
- Translucent materials* are those through which light is transmitted diffusely i.e. objects are not clearly distinguishable when viewed through.
- Those materials that are impervious to the transmission of visible light are termed as *opaque materials*. These materials absorb all the energy from the light photons.

## Optical properties – Metals

- Metals consist of partially filled high-energy conduction bands.
- When photons are directed at metals, their energy is used to excite electrons into unoccupied states. Thus metals are opaque to the visible light.
- Metals are, however, transparent to high end frequencies i.e. x-rays and  $\gamma$ -rays.
- Absorption of takes place in very thin outer layer. Thus, metallic films thinner than  $0.1\ \mu\text{m}$  can transmit the light.
- The absorbed radiation is emitted from the metallic surface in the form of visible light of the same wavelength as reflected light. The reflectivity of metals is about 0.95, while the rest of impinged energy is dissipated as heat
- The amount of energy absorbed by metals depends on the electronic structure of each particular metal. For example: with copper and gold there is greater absorption of the short wavelength colors such as green and blue and a greater reflection of yellow, orange and red wavelengths.

## Optical properties of non-metallic materials

- Non-metallic materials consist of various energy band structures. Thus, all four optical phenomena such as absorption, reflection, transmission and refraction are important for these materials.

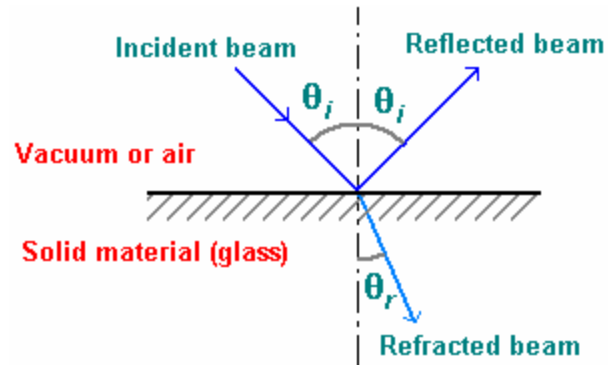
### Refraction

- when light photons are transmitted through a material, they causes polarization of the electrons and in-turn the speed of light is reduced and the beam of light changes direction.
- The relative velocity of light passing through a medium is expressed by the optical property called the index of refraction ( $n$ ), and is defined as

$$n = \frac{c_0}{c}$$

- where  $c_0$  – speed of light in vacuum,  $c$  – speed of light in the concerned material.
- If the angle of incidence from a normal to the surface is  $\theta_i$ , and the angle of refraction is  $\theta_r$ , the refractive index of the medium,  $n$ , is given by (provided that the incident light is coming from a phase of low refractive index such as vacuum or air)

$$n = \frac{\sin \theta_i}{\sin \theta_r}$$



- speed of light in a material can be related to its electrical and magnetic properties as

$$c = \frac{1}{\sqrt{\mu \cdot \epsilon}}$$

- where  $\epsilon$  – electrical permittivity, and  $\mu$  – magnetic permeability. Thus,

$$n = \frac{c_0}{c} = \frac{\sqrt{\mu \cdot \epsilon}}{\sqrt{\mu_0 \cdot \epsilon_0}} = \sqrt{\mu_r \cdot \epsilon_r}$$

- Since most materials are only slightly magnetic i.e.  $\mu_r \approx 1$ , Thus

$$n \cong \sqrt{\epsilon_r}$$

- Thus, for transparent materials, index of refraction and dielectric constant are related.

### Refractive indices of some materials

<i>Material</i>	<i>Refractive index</i>	<i>Material</i>	<i>Refractive index</i>
Air	1.00	Epoxy	1.58
Ice	1.309	Polystyrene	1.60
Water	1.33	Spinel, $\text{MgAl}_2\text{O}_3$	1.72
Teflon	1.35	Sapphire, $\text{Al}_2\text{O}_3$	1.76
Silica glass	1.458	Rutile, $\text{TiO}_2$	2.68
Polymethyl methacrylate	1.49	Diamond	2.417
Silicate glass	1.50	Silicon	3.29
Polyethylene	1.52	Gallium arsenide	3.35
NaCl	1.54	Germanium	4.00

- Snell's law of light refraction: refractive indices for light passing through from one medium with refractive index  $n$  through another of refractive index  $n'$  is related to the incident angle,  $\theta$ , and refractive angle,  $\theta'$ , by

$$\frac{n}{n'} = \frac{\sin \theta'}{\sin \theta}$$

## Reflection

- Reflectivity is defined as fraction of light reflected at an interface.

$$R = \frac{I_R}{I_0}$$

- Where  $I_0$  and  $I_R$  are the incident and reflected beam intensities respectively.
- If the material is in a vacuum or in air then

$$R = \left( \frac{n-1}{n+1} \right)^2$$

- If the material is in some other medium with an index of refraction of  $n_i$ , then

$$R = \left( \frac{n-n_i}{n+n_i} \right)^2$$

- The above equations apply to the reflection from a single surface and assume normal incidence. The value of  $R$  depends upon the angle of incidence.
- Materials with a high index of refraction have a higher reflectivity than materials with a low index. Because the index of refraction varies with the wavelength of the photons, so does the reflectivity.
- In metals, the reflectivity is typically on the order of 0.90-0.95, whereas for glasses it is close to 0.05. The high reflectivity of metals is one reason that they are opaque. High reflectivity is desired in many applications including mirrors, coatings on glasses, etc.

## Absorption

- When a light beam is impinged on a material surface, portion of the incident beam that is not reflected by the material is either absorbed or transmitted through the material.
- Bouguer's law: The fraction of beam that is absorbed is related to the thickness of the materials and the manner in which the photons interact with the material's structure.



$$I = I_0 \exp(-\alpha.x)$$

- where  $I$  – intensity of the beam coming out of the material,
- $I_0$  – intensity of the incident beam,
- $x$  – path through which the photons move, and
- $\alpha$  – linear absorption coefficient, which is characteristic of a particular material.

### Absorption mechanisms

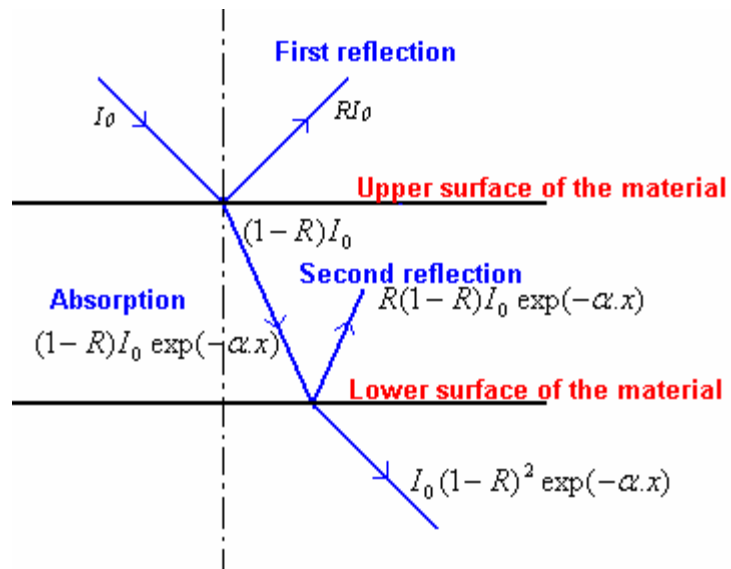
- Absorption occurs by two mechanisms: Rayleigh scattering and Compton scattering.
- **Rayleigh scattering:** where photon interacts with the electrons orbiting an atom and is deflected without any change in photon energy. This is significant for high atomic number atoms and low photon energies. Ex.: Blue color in the sunlight gets scattered more than other colors in the visible spectrum and thus making sky look blue.
- **Tyndall effect** is where scattering occurs from particles much larger than the wavelength of light. Ex.: Clouds look white.
- **Compton scattering:** interacting photon knocks out an electron losing some of its energy during the process. This is also significant for high atomic number atoms and low photon energies.
- **Photoelectric effect** occurs when photon energy is consumed to release an electron from atom nucleus. This effect arises from the fact that the potential energy barrier for electrons is finite at the surface of the metal. Ex.: Solar cells.

### Transmission

- Fraction of light beam that is not reflected or absorbed is transmitted through the material.

$$I_t = I_0(1 - R)^2 \exp(-\alpha.x)$$

- The process of light transmission is as follows



### Optical applications

- Light interacts with a material in many ways.
- Depending on the material, its crystal-/micro-structure, and also on the characteristics of incident light, there are many peculiar phenomena occurs, which are known as optical phenomena. These include:
  - luminescence
  - lasers
  - thermal emission
  - photo-conductivity
  - optical fibers
- All these find quite many applications in technology for every day life

### Luminescence

- It is the process where a material absorbs energy and then immediately emits visible or near-visible radiation. It consists of electron excitation and then dropping down to lower energy states.
- If the emission of radiation occurs within  $10^{-8}$  sec after excitation, the luminescence is called *fluorescence*, and if it takes longer than  $10^{-8}$  sec, it is known as *phosphorescence*.
- Ordinarily pure materials do not display this phenomenon. Special materials called *phosphors* have the capability of absorbing high-energy radiation and spontaneously emitting lower-energy radiation. Ex.: some sulfides, oxides, tungstates, and few organic materials.
- The intensity of luminescence is given as:

$$I = I_0 \exp\left(-\frac{t}{\tau}\right)$$

- where  $I_0$  – initial intensity of luminescence,
  - $I$  – fraction of luminescence after time,  $t$ ,
  - $\tau$  - relaxation time, constant for a material.
- Luminescence process is classified based on the energy source for electron excitation as *photo-luminescence*, *cathode-luminescence*, and *electro-luminescence*.

### Photo-luminescence

- *Photo-luminescence* occurs in fluorescent lamps.
- Here ultra-violet radiation from low-pressure mercury arc is converted to visible light by calcium halo-phosphate phosphor ( $\text{Ca}_{10}\text{F}_2\text{P}_6\text{O}_{24}$ ).
- In commercial lamps, about 20% of  $\text{F}^-$  ions are replaced with  $\text{Cl}^-$  ions.
- Antimony,  $\text{Sb}^{3+}$ , ions provide a blue emission while manganese,  $\text{Mn}^{2+}$ , ions provide an orange-red emission band.

### Cathode-luminescence

- *Cathode-luminescence* is produced by an energized cathode which generates a beam of high-energy bombarding electrons.
- Applications of this include electron microscope; cathode-ray oscilloscope; color television screens.
- The modern televisions have very narrow, about 0.25 mm wide, vertical stripes of red-, green-, and blue- emitting phosphors deposited on the inner surface of the screens.
- Commercial phosphors for different colors are: red – yttrium oxy-sulfide ( $\text{Y}_2\text{O}_3\text{S}$ ) with 3% europium (Eu); green –  $(\text{Zn,Cd})\text{S}$  with a  $\text{Cu}^+$  acceptor and  $\text{Al}^{3+}$  donor; blue – zinc sulfide ( $\text{ZnS}$ ) with  $\text{Ag}^+$  acceptor and  $\text{Cl}^-$  donor.

### Electro-luminescence

- *Electro-luminescence* occurs in devices with p-n rectifying junctions which are stimulated by an externally applied voltage.
- When a forward biased voltage is applied across the device, electrons and holes recombine at the junction and emit photons in the visible range (mono-chromatic light i.e. single color). These diodes are called *light emitting diodes* (LEDs).
- LEDs emit light of many colors, from red to violet, depending on the composition of the semiconductor material used.
- Ex.: GaAs, GaP, GaAlAs, and GaAsP are typical materials for LEDs.
- Materials for colored LEDs are

Wave length (nm)	Color	Material
-	Infra-red	GaAs
660	Red	$\text{GaP}_{0.40}\text{As}_{0.60}$ or $\text{Al}_{0.25}\text{Ga}_{0.75}\text{As}$
635	Orange	$\text{GaP}_{0.65}\text{As}_{0.35}$

578	Yellow	GaP <sub>0.85</sub> As <sub>0.15</sub>
556	Green	GaP (GaP <sub>1.00</sub> As <sub>0.00</sub> )
-	Blue	Ga <sub>0.94</sub> In <sub>0.06</sub>

## Lasers

- Laser is an acronym for *light amplification by stimulated emission of radiation*. It is in fact special application of luminescence.
- Unlike most radiation processes, such as luminescence, which produce incoherent light, the light produced by laser emission is coherent.
- This is based on the fact that in certain materials, electrons excited by a stimulus produce photons which in turn excite additional photons of identical wavelength. Thus a large amplification of the photons emitted in the material occurs.
- Lasers are useful in many applications such as welding, metal cutting, heat treatment, surgery, mapping, reading compact disks, etc. Ex.: Ruby, single crystal of Al<sub>2</sub>O<sub>3</sub> doped with little amount of Cr<sub>2</sub>O<sub>3</sub>; yttrium aluminium garnet (Y<sub>3</sub>Al<sub>5</sub>O<sub>12</sub> – YAG) doped with neodymium, Nd; CO<sub>2</sub> gas; He-Ne gas; some semi-conductors like GaAs and InGaAsP.

## Thermal emission

- When a material is heated, electrons are excited to higher energy levels, particularly in the outer energy levels where the electrons are less strongly bound to the nucleus.
- These excited electrons, upon dropping back to the ground state, release photons in process what is called *thermal emission*.
- During thermal emission a continuous spectrum of radiation is emitted with a minimum wavelength and the intensity distribution is dependent on the temperature.
- Higher the temperature, wider will be the range of wavelengths emitted. By measuring the intensity of a narrow band of the emitted wavelengths with a pyrometer, material's temperature can be estimated.

## Photo-conductivity

- Bombardment of semiconductors by photons, with energy equal to greater than the band gap, may result in creation of electron-hole pairs that can be used to generate current. This process is called *photo-conductivity*.
- It is different from photo-electric effect in the sense that an electron-hole pair is generated whose energy is related to the band gap energy instead of free electron alone whose energy is related to the Fermi level.
- The current produced in photo-conductivity is directly related to the incident light intensity.
- This phenomenon is utilized in photographic light meters. Cadmium sulfide (CdS) is commonly used for the detection of visible light, as in light meters.
- Photo-conductivity is also the underlying principle of the photo-voltaic cell, known to common man as *solar cell*, used for conversion of solar energy into electricity.

## Optical fibers

- Optical fibers have revolutionized the communication industry.
- These systems consists of transmitter (a semiconductor laser) to convert electrical signals to light signals, optical fiber to transmit the light signals, and a photodiode to convert light signals back to electrical signals.
- It primarily consists of core, cladding and coating. The core transmits the signals, while the cladding constrains the light beam to the core; outer coating protects the core and cladding from the external environment.
- Typically both the core and cladding are made of special types of glass with carefully controlled indices of refraction.
- The indices of refraction are selected such that

$$n_{cladding} < n_{core}$$

- Once the light enters the core from the source, it is reflected internally and propagates along the length of the fiber.
- Internal reflection is accomplished by varying the index of refraction of the core and cladding glass materials. Usually two designs are employed in this regard.

## Types of optical fibers

- In *step-index optical fiber*, there is a sharp change in refractive index between the core and cladding. In this design output pulse will be broader than the input one. It is because light rays traveling in different trajectories have a variety of path lengths.
- It is possible to avoid pulse broadening by using *graded-index fiber*. This results in a helical path for the light rays, as opposed to zig-zag path in a step-index fiber.
- Here impurities such as boron oxide ( $B_2O_3$ ) or germanium dioxide ( $GeO_2$ ) are added to the silica glass such that the index of refraction varied gradually in parabolic manner across the cross section. This enables light to travel faster while close to the periphery than at the center. This avoids pulse broadening.
- Both step- and graded- index fibers are termed as multi-mode fibers.
- Third type optical fiber is called *single-mode fiber* in which light travels largely parallel to the fiber axis with little distortion of the digital light pulse. These are used for long transmission lines.

## Optical fiber properties

- Core and cladding materials are selected not only on the basis of their refractive indices, but also on basis of ease of manufacturability, light loss, mechanical strength properties and dispersion properties.
- However, density ( $\rho$ ) and refractive index ( $n$ ) are critical. These two parameters are related approximately as

$$n = \frac{\rho + 10.4}{8.6}$$

- High-purity silica-based glasses are used as fiber material, with fiber diameter ranging from 5 to 100  $\mu\text{m}$ .
- The fibers are carefully fabricated to be virtually free from flaws.

Multiple Choice Questions' Bank:

1. Visible light's wavelength range \_\_\_\_\_.

- |                    |                               |
|--------------------|-------------------------------|
| (a) 0.39 – 0.77 mm | (b) 0.39 – 0.77 $\mu\text{m}$ |
| (c) 0.39 – 0.77 nm | (d) 0.39 – 0.77 cm            |

2. Planck's constant

- (a)  $6.62 \times 10^{-34}$  J.sec    (b)  $6.62 \times 10^{-34}$  J.min    (c)  $6.62 \times 10^{-34}$  Cal.sec    (d)  $6.62 \times 10^{-34}$  Cal.min

3. Sum of these is unity

- (a) Reflectivity                      (b) Reflectivity + Refractivity  
(c) Reflectivity + Refractivity + Transmittivity                      (d) Any

4. Metals can \_\_\_\_\_ the light beams.

- (a) Reflect                      (b) Refract                      (c) Transmit                      (d) Any

5. Metals are \_\_\_\_\_.

- (a) Transparent                      (b) Opaque                      (c) Translucent                      (d) None

6. Metals can transmit these \_\_\_\_.

- (a) Radio waves                      (b) Visible light                      (c) Microwaves                      (d) x-rays

7. Reflectivity of metals

- (a) 0.05                      (b) 0.50                      (c) 0.95                      (d) None

8. Refractive index of materials is approximately equal to square root of

- (a) electrical permittivity                      (b) magnetic permeability  
(c) electrical permittivity x magnetic permeability                      (d) None

9. Snell's law relates \_\_\_\_\_.

- (a) Light reflection      (b) Light refraction      (c) Light transmission (d) Light Absorption

10. Bouguer's law relates \_\_\_\_\_.

- (a) Light reflection      (b) Light refraction      (c) Light transmission (d) Light Absorption

11. Sky looks blue because the sun light is subjected to \_\_\_\_\_.

- (a) Rayleigh scattering                      (b) Compton scattering                      (c) Both                      (d) None

12. Luminescence is because of

- (a) Photons emitted while excited electrons drops down  
(b) Knocking out of electrons by photons  
(c) Photons stimulated by photons  
(d) All

13. Fluorescence occurs within \_\_\_\_\_.

- (a)  $10^{-5}$ s.                      (b)  $10^{-5}$ ms.                      (c)  $10^{-5}$ μs.                      (d)  $10^{-5}$ ns.

14. Electro-luminescence occurs in \_\_\_\_\_.

- (a) Electrical conductors                      (b) Electrical insulators                      (c) p-n junctions                      (d) all

15. Pyrometer works based on

- (a) Laser technology    (b) Photo-conduction    (c) Thermal emission    (c) Tyndall effect

16. Solar cell works based on

(a) Laser technology (b) Photo-conduction (c) Thermal emission (c) Tyndall effect

17. Optical fiber operates on the principle of

(a) Total internal reflectance (b) Tyndall effect (c) Photo-electric effect (d)  
Laser technology

Answers:

1. b
2. a
3. c
4. a
5. b
6. d
7. c
8. a
9. b
10. d
11. a
12. a
13. b
14. c
15. c
16. b
17. a



