

TABLE 22 Room-temperature Dispersion Formulas for Crystals (*Continued*)

Material	Dispersion formula (wavelength, λ , in μm)	Range (μm)	Ref.
ZnO	$n_o^2 = 2.81418 + \frac{0.87968\lambda^2}{\lambda^2 - (0.3042)^2} - 0.00711\lambda^2$ $n_e^2 = 2.80333 + \frac{0.94470\lambda^2}{\lambda^2 - (0.3004)^2} - 0.00714\lambda^2$	0.45–4.0	183
β -ZnS	$n^2 - 1 = \frac{0.33904026\lambda^2}{\lambda^2 - (0.31423026)^2} + \frac{3.7606868\lambda^2}{\lambda^2 - (0.1759417)^2} + \frac{2.7312353\lambda^2}{\lambda^2 - (33.886560)^2}$	0.55–10.5	113
α -ZnS	$n_o^2 - 1 = 3.4175 + \frac{1.7396\lambda^2}{\lambda^2 - (0.2677)^2}$ $n_e^2 - 1 = 3.4264 + \frac{1.7491\lambda^2}{\lambda^2 - (0.2674)^2}$	0.36–1.4	211
ZnSe	$n^2 - 1 = \frac{4.2980149\lambda^2}{\lambda^2 - 0.1920630^2} + \frac{0.62776557\lambda^2}{\lambda^2 - 0.37878260^2} + \frac{2.8955633\lambda^2}{\lambda^2 - 46.994595^2}$	0.55–18	113
ZnTe	$n^2 = 9.92 + \frac{0.42530}{\lambda^2 - (0.37766)^2} + \frac{2.63580}{\lambda^2 - (56.5)^2 - 1}$	0.55–30	212
ZrO ₂ :12%Y ₂ O ₃	$n^2 - 1 = \frac{1.347091\lambda^2}{\lambda^2 - (0.062543)^2} + \frac{2.117788\lambda^2}{\lambda^2 - (0.166739)^2} + \frac{9.452943\lambda^2}{\lambda^2 - (24.320570)^2}$	0.36–5.1	148

TABLE 23 Room-temperature Dispersion Formula for Glasses

Material	Dispersion formula (wavelength, λ , in μm)	Range (μm)	Ref.
TiK1	$n^2 = 2.1573978 - 8.4004189 \cdot 10^{-3}\lambda^2 + 1.0457582 \cdot 10^{-2}\lambda^{-2}$ $+ 2.1822593 \cdot 10^{-4}\lambda^{-4} - 5.5063640 \cdot 10^{-6}\lambda^{-6} + 5.4469060 \cdot 10^{-7}\lambda^{-8}$	0.37–1.01	149
FK5	$n^2 = 2.1887621 - 9.5572007 \cdot 10^{-3}\lambda^2 + 8.9915232 \cdot 10^{-3}\lambda^{-2}$ $+ 1.4560516 \cdot 10^{-4}\lambda^{-4} - 5.2843067 \cdot 10^{-6}\lambda^{-6} + 3.4588010 \cdot 10^{-7}\lambda^{-8}$ $n^2 - 1 = \frac{1.036330719\lambda^2}{\lambda^2 - (0.0776227030)^2} + \frac{0.152107703\lambda^2}{\lambda^2 - (0.138959626)^2} + \frac{0.913166269\lambda^2}{\lambda^2 - (9.93162512)^2}$	0.37–1.01† 0.37–2.33	149 42
TiF1	$n^2 = 2.2473124 - 8.9044058 \cdot 10^{-3}\lambda^2 + 1.2493525 \cdot 10^{-2}\lambda^{-2}$ $+ 4.2650638 \cdot 10^{-4}\lambda^{-4} - 2.1564809 \cdot 10^{-6}\lambda^{-6} + 2.6364065 \cdot 10^{-6}\lambda^{-8}$	0.37–1.01	149
BK7	$n^2 = 2.2718929 - 1.0108077 \cdot 10^{-2}\lambda^2 + 1.0592509 \cdot 10^{-2}\lambda^{-2}$ $+ 2.0816965 \cdot 10^{-4}\lambda^{-4} - 7.6472538 \cdot 10^{-6}\lambda^{-6} + 4.9240991 \cdot 10^{-7}\lambda^{-8}$	0.37–1.01†	149
PK2	$n^2 = 2.2770533 - 1.0532010 \cdot 10^{-2}\lambda^2 + 1.0188354 \cdot 10^{-2}\lambda^{-2}$ $+ 2.9001564 \cdot 10^{-4}\lambda^{-4} - 1.9602856 \cdot 10^{-6}\lambda^{-6} + 1.0967718 \cdot 10^{-6}\lambda^{-8}$	0.37–1.01	149
K5	$n^2 = 2.2850299 - 8.6010725 \cdot 10^{-3}\lambda^2 + 1.1806783 \cdot 10^{-2}\lambda^{-2}$ $+ 2.0765657 \cdot 10^{-4}\lambda^{-4} - 2.1314913 \cdot 10^{-6}\lambda^{-6} + 3.2131234 \cdot 10^{-7}\lambda^{-8}$	0.37–1.01†	149
KF9	$n^2 = 2.2824396 - 8.5960144 \cdot 10^{-3}\lambda^2 + 1.3442645 \cdot 10^{-2}\lambda^{-2}$ $+ 2.7803535 \cdot 10^{-4}\lambda^{-4} - 4.9998960 \cdot 10^{-7}\lambda^{-6} + 7.7105911 \cdot 10^{-7}\lambda^{-8}$	0.37–1.01†	149
BaLK1	$n^2 = 2.2966923 - 8.2975549 \cdot 10^{-3}\lambda^2 + 1.1907234 \cdot 10^{-2}\lambda^{-2}$ $+ 1.9908305 \cdot 10^{-4}\lambda^{-4} - 2.0306838 \cdot 10^{-6}\lambda^{-6} + 3.1429703 \cdot 10^{-7}\lambda^{-8}$	0.37–1.01	149
KzF6	$n^2 = 2.2934044 - 1.0346122 \cdot 10^{-2}\lambda^2 + 1.3319863 \cdot 10^{-2}\lambda^{-2}$ $+ 3.4833226 \cdot 10^{-4}\lambda^{-4} - 9.9354090 \cdot 10^{-6}\lambda^{-6} + 1.1227905 \cdot 10^{-6}\lambda^{-8}$	0.37–1.01	149
ZK1	$n^2 = 2.3157951 - 8.7493905 \cdot 10^{-3}\lambda^2 + 1.2329645 \cdot 10^{-2}\lambda^{-2}$ $+ 2.6311112 \cdot 10^{-4}\lambda^{-4} - 8.2854201 \cdot 10^{-6}\lambda^{-6} + 7.3735801 \cdot 10^{-7}\lambda^{-8}$	0.37–1.01	149

1/3

TABLE 23 Room-temperature Dispersion Formula for Glasses (*Continued*)

Material	Dispersion formula (wavelength, λ , in μm)	Range (μm)	Ref.
LLF1	$n^2 = 2.3505162 - 8.5306451 \cdot 10^{-3}\lambda^2 + 1.5750853 \cdot 10^{-2}\lambda^{-2}$ $+ 4.2811388 \cdot 10^{-4}\lambda^{-4} - 6.9875718 \cdot 10^{-6}\lambda^{-6} + 1.7175517 \cdot 10^{-6}\lambda^{-8}$	0.37–1.01†	149
Ultralan 30	$n^2 = 2.3677942 - 6.0818906 \cdot 10^{-3}\lambda^2 + 1.0509568 \cdot 10^{-2}\lambda^{-2}$ $+ 1.3105575 \cdot 10^{-4}\lambda^{-4} - 4.9854380 \cdot 10^{-7}\lambda^{-6} + 1.0473652 \cdot 10^{-7}\lambda^{-8}$	0.37–1.01†	149
	$n^2 - 1 = \frac{1.36689\lambda^2}{\lambda^2 - (0.089286)^2} + \frac{0.34711\lambda^2}{\lambda^2 - (7.9103)^2}$	0.37–2.3	149*
PSK3	$n^2 = 2.3768193 - 1.0146514 \cdot 10^{-2}\lambda^2 + 1.2167148 \cdot 10^{-2}\lambda^{-2}$ $+ 1.1916606 \cdot 10^{-4}\lambda^{-4} + 6.4250627 \cdot 10^{-6}\lambda^{-6} - 1.7478706 \cdot 10^{-7}\lambda^{-8}$	0.37–1.01	149
BaK1	$n^2 = 2.4333007 - 8.4931353 \cdot 10^{-3}\lambda^2 + 1.3893512 \cdot 10^{-2}\lambda^{-2}$ $+ 2.6798268 \cdot 10^{-4}\lambda^{-4} - 6.1946101 \cdot 10^{-6}\lambda^{-6} + 6.2209005 \cdot 10^{-7}\lambda^{-8}$	0.37–1.01†	149
BaLF4	$n^2 = 2.4528366 - 9.2047678 \cdot 10^{-3}\lambda^2 + 1.4552794 \cdot 10^{-2}\lambda^{-2}$ $+ 4.3046688 \cdot 10^{-4}\lambda^{-4} - 2.0489836 \cdot 10^{-5}\lambda^{-6} + 1.5924415 \cdot 10^{-6}\lambda^{-8}$	0.37–1.01†	149
	$n^2 - 1 = \frac{1.25385390\lambda^2}{\lambda^2 - (0.0856548405)^2} + \frac{0.198113511\lambda^2}{\lambda^2 - (0.173243878)^2} + \frac{1.01615191\lambda^2}{\lambda^2 - (10.8069635)^2}$	0.37–2.33	42
LF5	$n^2 = 2.4441760 - 8.3059695 \cdot 10^{-3}\lambda^2 + 1.9000697 \cdot 10^{-2}\lambda^{-2}$ $+ 5.4129697 \cdot 10^{-4}\lambda^{-4} - 4.1973155 \cdot 10^{-6}\lambda^{-6} + 2.3742897 \cdot 10^{-6}\lambda^{-8}$	0.37–1.01†	149
LgSK2	$n^2 = 2.4750760 - 5.4304528 \cdot 10^{-3}\lambda^2 + 1.3893210 \cdot 10^{-2}\lambda^{-2}$ $+ 2.2990560 \cdot 10^{-4}\lambda^{-4} - 1.6868474 \cdot 10^{-6}\lambda^{-6} + 4.3959703 \cdot 10^{-7}\lambda^{-8}$	0.37–1.01	149
FF5	$n^2 = 2.4743324 - 1.0955338 \cdot 10^{-2}\lambda^2 + 1.9293801 \cdot 10^{-2}\lambda^{-2}$ $+ 1.4497732 \cdot 10^{-3}\lambda^{-4} - 1.1038744 \cdot 10^{-4}\lambda^{-6} + 1.1136008 \cdot 10^{-5}\lambda^{-8}$	0.37–1.01	151
SK4	$n^2 = 2.5585228 - 9.8824951 \cdot 10^{-3}\lambda^2 + 1.5151820 \cdot 10^{-2}\lambda^{-2}$ $+ 2.1134478 \cdot 10^{-4}\lambda^{-4} - 3.4130130 \cdot 10^{-6}\lambda^{-6} + 1.2673355 \cdot 10^{-7}\lambda^{-8}$	0.37–1.01†	149
KzFSN4	$n^2 = 2.5293446 - 1.3234586 \cdot 10^{-2}\lambda^2 + 1.8586165 \cdot 10^{-2}\lambda^{-2}$ $+ 5.4759655 \cdot 10^{-4}\lambda^{-4} - 1.1717987 \cdot 10^{-5}\lambda^{-6} + 2.0042905 \cdot 10^{-6}\lambda^{-8}$	0.37–1.01†	149
	$n^2 - 1 = \frac{1.38374965\lambda^2}{\lambda^2 - (0.0948292206)^2} + \frac{0.164626811\lambda^2}{\lambda^2 - (0.201806158)^2} + \frac{0.85913757\lambda^2}{\lambda^2 - (8.28807544)^2}$	0.37–2.33	42
SSK4	$n^2 = 2.5707849 - 9.2577764 \cdot 10^{-3}\lambda^2 + 1.6170751 \cdot 10^{-2}\lambda^{-2}$ $+ 2.7742702 \cdot 10^{-4}\lambda^{-4} + 1.2686469 \cdot 10^{-7}\lambda^{-6} + 4.5044790 \cdot 10^{-7}\lambda^{-8}$	0.37–1.01	149
F2	$n^2 = 2.5554063 - 8.8746150 \cdot 10^{-3}\lambda^2 + 2.2494787 \cdot 10^{-2}\lambda^{-2}$ $+ 8.6924972 \cdot 10^{-4}\lambda^{-4} - 2.4011704 \cdot 10^{-5}\lambda^{-6} + 4.5365169 \cdot 10^{-6}\lambda^{-8}$	0.37–1.01†	149
BaSF10	$n^2 = 2.6531250 - 8.1388553 \cdot 10^{-3}\lambda^2 + 2.2995643 \cdot 10^{-2}\lambda^{-2}$ $+ 7.3535957 \cdot 10^{-4}\lambda^{-4} - 1.3407390 \cdot 10^{-5}\lambda^{-6} + 3.6962325 \cdot 10^{-6}\lambda^{-8}$	0.37–1.01†	149
BaF10	$n^2 = 2.7324621 - 1.2490460 \cdot 10^{-2}\lambda^2 + 1.8562334 \cdot 10^{-2}\lambda^{-2}$ $+ 9.9990536 \cdot 10^{-4}\lambda^{-4} - 6.8388552 \cdot 10^{-5}\lambda^{-6} + 4.9257931 \cdot 10^{-6}\lambda^{-8}$	0.37–1.01	151
LaK10	$n^2 = 2.8984614 - 1.4857039 \cdot 10^{-2}\lambda^2 + 2.0985037 \cdot 10^{-2}\lambda^{-2}$ $+ 5.4506921 \cdot 10^{-4}\lambda^{-4} - 1.7297314 \cdot 10^{-5}\lambda^{-6} + 1.7993601 \cdot 10^{-6}\lambda^{-8}$	0.37–1.01	149
TaC2	$n^2 = 2.9717137 - 1.4952593 \cdot 10^{-2}\lambda^2 + 2.0162868 \cdot 10^{-2}\lambda^{-2}$ $+ 9.4072283 \cdot 10^{-4}\lambda^{-4} - 8.8614104 \cdot 10^{-5}\lambda^{-6} + 5.3191242 \cdot 10^{-6}\lambda^{-8}$	0.37–1.01	151
NbF1	$n^2 = 2.9753491 - 1.4613470 \cdot 10^{-2}\lambda^2 + 2.1096383 \cdot 10^{-2}\lambda^{-2}$ $+ 1.1980380 \cdot 10^{-3}\lambda^{-4} - 1.1887388 \cdot 10^{-4}\lambda^{-6} + 7.3444350 \cdot 10^{-6}\lambda^{-8}$	0.37–1.01	151
LaF2	$n^2 = 2.9673787 - 1.0978767 \cdot 10^{-2}\lambda^2 + 2.5088607 \cdot 10^{-2}\lambda^{-2}$ $+ 6.3171596 \cdot 10^{-4}\lambda^{-4} - 7.5645417 \cdot 10^{-6}\lambda^{-6} + 2.3202213 \cdot 10^{-6}\lambda^{-8}$	0.37–1.01†	149
SF6	$n^2 = 3.1195007 - 1.0902580 \cdot 10^{-2}\lambda^2 + 4.1330651 \cdot 10^{-2}\lambda^{-2}$ $+ 3.1800214 \cdot 10^{-3}\lambda^{-4} - 2.1953184 \cdot 10^{-4}\lambda^{-6} + 2.6671014 \cdot 10^{-5}\lambda^{-8}$	0.37–1.01†	149

Material	Dispersion formula (wavelength, λ , in μm)	Range (μm)	Ref.
TaFD5	$n^2 = 3.2729098 - 1.2888257 \cdot 10^{-2} \lambda^2 + 3.3451363 \cdot 10^{-2} \lambda^{-2} + 6.8221381 \cdot 10^{-5} \lambda^{-4} + 1.1215427 \cdot 10^{-4} \lambda^{-6} - 4.0485659 \cdot 10^{-6} \lambda^{-8}$	0.37–1.01	151
Fused silica	$n^2 - 1 = \frac{0.6961663\lambda^2}{\lambda^2 - (0.0684043)^2} + \frac{0.4079426\lambda^2}{\lambda^2 - (0.1162414)^2} + \frac{0.8974794\lambda^2}{\lambda^2 - (9.896161)^2}$	0.21–3.71	152
Fused germania	$n^2 - 1 = \frac{0.80686642\lambda^2}{\lambda^2 - (0.06897261)^2} + \frac{0.71815848\lambda^2}{\lambda^2 - (0.1539661)^2} + \frac{0.85416831\lambda^2}{\lambda^2 - (11.841931)^2}$	0.36–4.3	153
BS-39B	$n^2 - 1 = \frac{1.7441\lambda^2}{\lambda^2 - (0.1155)^2} + \frac{1.6465\lambda^2}{\lambda^2 - (14.981)^2}$	0.43–4.5	154*
CORTAN 9753	$n = 1.61251@0.4861 \mu\text{m}$ $n = 1.60475@0.5893 \mu\text{m}$ $n = 1.60151@0.6563 \mu\text{m}$	—	155
CORTAN 9754	$n = 1.6702@0.4861 \mu\text{m}$ $n = 1.6560@0.6563 \mu\text{m}$ $n = 1.6601@0.5893 \mu\text{m}$ $n = 1.617 @3.5 \mu\text{m}$	—	155
IRG 2	$n^2 - 1 = \frac{2.07670\lambda^2}{\lambda^2 - (0.11492)^2} + \frac{0.35738\lambda^2}{\lambda^2 - (0.23114)^2} + \frac{2.88166\lambda^2}{\lambda^2 - (17.48306)^2}$	0.365–4.6	149*
IRG 9	$n^2 - 1 = \frac{1.1852\lambda^2}{\lambda^2 - (0.084353)^2} + \frac{0.66877\lambda^2}{\lambda^2 - (11.568)^2}$	0.365–4.6	149*
IRG 11	$n^2 - 1 = \frac{1.7531\lambda^2}{\lambda^2 - (0.1185)^2} + \frac{0.4346\lambda^2}{\lambda^2 - (8.356)^2}$	0.48–3.3	149*
IRG 100	$n^2 = 4.5819 + \frac{2.2693\lambda^2}{\lambda^2 - (0.447)^2} - 0.000928\lambda^2$	1–14	149*
HTF-1	$n^2 = 2.0633034 - 3.2906345 \cdot 10^{-3} \lambda^2 + 7.1765160 \cdot 10^{-3} \lambda^{-2} - 1.9110559 \cdot 10^{-4} \lambda^{-4} + 3.8123441 \cdot 10^{-5} \lambda^{-6} - 2.0668501 \cdot 10^{-6} \lambda^{-8}$	0.37–1.01	150
	$n^2 - 1 = \frac{1.06375\lambda^2}{\lambda^2 - (0.078958)^2} + \frac{0.80098\lambda^2}{\lambda^2 - (15.1579)^2}$	0.37–5	150*
ZBL	$n^2 = 2.03 + \frac{0.265\lambda^2}{\lambda^2 - (0.182)^2} + \frac{1.22\lambda^2}{\lambda^2 - (20.7)^2} + \frac{1.97\lambda^2}{\lambda^2 - (37.9)^2}$	1–5	213
ZBLA	$n^2 - 1 = \frac{1.291\lambda^2}{\lambda^2 - (0.0969)^2} + \frac{2.76\lambda^2}{\lambda^2 - (26.0)^2}$	0.64–4.8	158
ZBLAN	$n^2 - 1 = \frac{1.168\lambda^2}{\lambda^2 - (0.0954)^2} + \frac{2.77\lambda^2}{\lambda^2 - (25.0)^2}$	0.50–4.8	158
ZBT			
HBL	$n^2 = 1.96 + \frac{0.299\lambda^2}{\lambda^2 - (0.172)^2} + \frac{0.86\lambda^2}{\lambda^2 - (20.8)^2} + \frac{2.22\lambda^2}{\lambda^2 - (41.5)^2}$	1–5	213
HBLA			
HBT			
Arsenic trisulfide	$n^2 - 1 = \frac{1.8983678\lambda^2}{\lambda^2 - (0.150)^2} + \frac{1.9222979\lambda^2}{\lambda^2 - (0.250)^2} + \frac{0.8765134\lambda^2}{\lambda^2 - (0.350)^2} + \frac{0.1188704\lambda^2}{\lambda^2 - (0.450)^2} + \frac{0.9569903\lambda^2}{\lambda^2 - (27.3861)^2}$	0.56–12	163
Arsenic triselenide	$n^2 - 1 = \frac{6.6906\lambda^2}{\lambda^2 - (0.3468)^2}$	0.83–1.15	165
AMTIR-1/II-20	$n^2 - 1 = \frac{5.298\lambda^2}{\lambda^2 - (0.29007)^2} + \frac{0.6039\lambda^2}{\lambda^2 - (32.022)^2}$	1–14	167*
AMTIR-3/III-1173	$n^2 - 1 = \frac{5.8505\lambda^2}{\lambda^2 - (0.29192)^2} + \frac{1.4536\lambda^2}{\lambda^2 - (42.714)^2}$	3–14	167*
	$n^2 - 1 = \frac{5.8357\lambda^2}{\lambda^2 - (0.29952)^2} + \frac{1.064\lambda^2}{\lambda^2 - (38.353)^2}$	0.9–14	214

* Out dispersion equation from referenced data.

† Schott dispersion formula range; data available to 2.3 μm .

3/3