SPECIFICATION TABLE NO. 77 NORMAL TOTAL EMITTANCE OF CHROMIUM OXIDES

Curve No.	Ref. No.	Year	Temperature Range, K	Geometry θ'	Reported Error, %	Composition (weight percent), Specifications and Remarks
1*	28	1963	1023	~0°		Cr_2O_3; sintered at 2173 K for 2 hrs (setter material Cr_2O_3); density 3.15 g cm^{-3}, theoretical density 5.21 g cm^{-3}; integrated from spectral data (1-15 μm); [Authors' designation: Sample No. 115].
2*	200	1962	1273	~0°		Cr_2O_3; 99.5 pure; 1.3 mm thick plate; sintered at 2123 K for 2 hrs.
3*	362	1964	873-1273	0°		Cr_2O_3; 99.5 pure powder, McGean Chemical Co.; sintered 2 hrs at 2173 K.
4*	362	1964	873-1273	0°		Cr_2O_3; similar to above specimen and conditions except calculated from spectral data (1-15 μm).

DATA TABLE NO. NORMAL TOTAL EMITTANCE OF CHROMIUM OXIDE

[Temperature, T, K; Emittance, ∈]

T	∈
CURVE 1*	
1023	0.91
CURVE 2*	
1273	0.69
CURVE 3*	
873	0.85
1073	0.90
1273	0.80
CURVE 4*	
873	0.86
1073	0.91
1273	0.82

* No plot given

SPECIFICATION TABLE NO. 78 NORMAL SPECTRAL EMITTANCE OF CHROMIUM OXIDES

Curve No.	Ref. No.	Year	Temperature K	Wavelength Range, μm	Geometry θ'	Reported Error, %	Composition (weight percent), Specifications, and Remarks
1	200	1962	1273	1.00-15.0	~0°		Cr_2O_3; 99.5 pure; 1.3 mm thick plate; sintered at 2123 K for 2 hrs; data extracted from smooth curve.
2	28	1963	1023	1.00-15.0	~0°		Cr_2O_3; sintered at 2173 K for 2 hrs (setter material Cr_2O_3); density 3.15 g cm^{-3}, theoretical density 5.21 g cm^{-3}; data extracted from smooth curve; [Authors' designation; Sample No. 115].
3	382	1965	1273	1.00-15.0	0°		Cr_2O_3; sintered 15 hrs at 1273 K; density 2.05; data extracted from smooth curve.
4	382	1965	1273	1.00-15.0	0°		Above specimen and conditions except sintered additionally 2 hrs at 1373 K, 2 hrs at 1473 K, and 2 hrs at 1573 K; density increased to 2.87.
5	382	1965	1273	1.00-15.0	0°		Above specimen and conditions except sintered an additional 2 hrs at 1923 K; density decreased to 2.23.
6	362	1964	878	1.00-15.0	~0°		Cr_2O_3; 99.5 pure powder, McGean Chemical Co.; sintered 2 hrs at 2173 K; data extracted from smooth curve.
7*	362	1964	1073	1.00-15.0	~0°		Above specimen and conditions.
8	362	1964	1273	1.00-15.00	~0°		Above specimen and conditions.
9	393	1966	1273	1.00-15.00	~0°		Cr_2O_3; cold pressed and sintered at 2123 K for 2 hrs; 2 or 3 wt. percent polyvinyl binder; density 3.29 g cm^{-3}; data extracted from smooth curve.

*Not shown on plot

DATA TABLE NO. 78 NORMAL SPECTRAL EMITTANCE OF CHROMIUM OXIDES

[Wavelength, λ, μm; Emittance, ∈; Temperature, T, K]

CURVE 1
T = 1273

λ	∈
1.00	0.760
1.30	0.660
1.40	0.640
1.60	0.640
1.90	0.675
3.00	0.675
3.60	0.685
4.00	0.690
4.20	0.670
4.30	0.665
4.40	0.675
6.00	0.685
6.80	0.710
7.60	0.750
8.00	0.775
8.60	0.800
9.00	0.825
10.0	0.845
10.2	0.860
10.4	0.860*
10.4	0.880
11.8	0.890
13.2	0.910
14.0	0.920
14.1	0.920*
14.7	0.815
14.9	0.780*
15.0	0.780

CURVE 2
T = 1023

λ	∈
1.00	0.885
1.16	0.835
1.50	0.816
1.78	0.846
1.92	0.881
2.10	0.905
2.38	0.922
2.54	0.922
2.62	0.900
2.96	0.913
3.16	0.947
3.79	0.952

CURVE 2 (cont.)

λ	∈
4.16	0.965
4.27	0.930
4.50	0.927
4.62	0.937
5.62	0.924
5.72	0.935
5.88	0.921
6.52	0.927
6.65	0.938
6.72	0.922
6.99	0.931
7.98	0.931
8.13	0.899
8.29	0.899*
8.43	0.911
8.74	0.911
8.80	0.922
8.88	0.896
8.98	0.915
9.26	0.915
9.50	0.906
9.78	0.916*
10.0	0.923*
10.5	0.938
11.5	0.948*
12.7	0.955
12.8	0.965
13.0	0.956
13.4	0.968*
13.8	0.973
14.0	0.962
14.2	0.950*
14.4	0.945
14.7	0.907
14.9	0.896
15.0	0.915

CURVE 3
T = 1273

λ	∈
1.00	0.671
5.05	0.706
5.99	0.706
7.00	0.761
9.37	0.880

CURVE 3 (cont.)

λ	∈
10.3	0.908
12.7	0.957
13.7	0.954
14.2	0.933
14.6	0.879
15.0	0.828

CURVE 4
T = 1273

λ	∈
1.00	0.726
5.46	0.749
6.77	0.765
7.83	0.805
9.31	0.879
10.3	0.908*
12.7	0.957*
13.7	0.954*
14.2	0.933*
14.6	0.879*
15.0	0.828*

CURVE 5
T = 1273

λ	∈
1.00	0.763
4.81	0.767
5.90	0.770
6.87	0.799
7.55	0.848
9.18	0.912*
10.1	0.944
11.0	0.966
12.8	0.991
13.3	0.994
14.0	0.979
14.5	0.948
15.0	0.897

CURVE 6
T = 878

λ	∈
1.00	0.779
1.40	0.798
2.01	0.810

CURVE 6 (cont.)

λ	∈
2.76	0.823
3.11	0.841
6.46	0.890
8.11	0.900
10.4	0.923
12.1	0.925
13.2	0.940
13.6	0.937*
13.8	0.926
14.1	0.892
14.6	0.805
14.7	0.784
15.0	0.769

CURVE 7*
T = 1073

λ	∈
1.00	0.863
2.00	0.867
2.63	0.889
5.12	0.907
6.44	0.913
7.41	0.926
8.54	0.926
12.7	0.973
14.0	0.980
14.2	0.953
14.5	0.901
14.7	0.875
15.0	0.856

CURVE 8
T = 1273

λ	∈
1.00	0.735
1.97	0.778
3.11	0.841
6.43	0.882
8.11	0.900*
10.4	0.924*
11.9	0.940
12.2	0.947
13.3	0.954*
13.7	0.962
13.9	0.963*

CURVE 8 (cont.)

λ	∈
14.4	0.926
14.9	0.873
15.0	0.856

CURVE 9
T = 1273

λ	∈
1.00	0.670
2.28	0.672
3.16	0.674
4.61	0.667
5.53	0.671
6.08	0.685
6.86	0.719
8.14	0.777
8.77	0.803
9.56	0.830
11.6	0.879
13.3	0.904
14.1	0.918
14.3	0.911
14.6	0.877*
15.0	0.817

*Not shown on plot

SPECIFICATION TABLE NO. 79 NORMAL SPECTRAL REFLECTANCE OF CHROMIUM OXIDES

Curve No.	Ref. No.	Year	Temperature K	Wavelength Range, μm	Geometry θ	Geometry θ'	Geometry ω'	Reported Error, %	Composition (weight percent), Specifications, and Remarks
1	28	1963	298	0.230-2.65	~0°		2π		Cr_2O_3; sintered at 2173 K for 2 hrs (setter material Cr_2O_3): density 3.15 g cm^{-3}, theoretical density 5.21 g cm^{-3}; MgO reference standard; data extracted from smooth curve; [Authors' designation: Sample No. 115].
2	362	1964	~298	0.230-2.65	0°		2π		Cr_2O_3; 99.5 pure powder, McGean Chemical Corp; mesh size 325; compacted at 11 500 psi with highly polished stainless steel ram; data extracted from smooth curve; MgO reference standard.
3*	362	1964	~298	0.230-2.65	~0°		2π		Similar to above specimen and conditions except compacted at 23 200 psi.
4	362	1964	~298	0.230-2.65	~0°		2π		Similar to above specimen and conditions except compacted at 34 600 psi.
5	362	1964	~298	0.230-2.65	0°		2π		CrO_3; 99.6 pure powder, Fisher Scientific Co.; mesh size 325; compacted at 11 500 psi with highly polished stainless steel ram; data extracted from smooth curve; MgO reference standard.
6*	362	1964	~298	0.230-2.65	~0°		2π		Similar to above specimen and conditions except compacted at 23 200 psi.
7	362	1964	~298	0.230-2.65	~0°		2π		Similar to above specimen and conditions except compacted at 34 600 psi.

*Not shown on plot

DATA TABLE NO. 79 NORMAL SPECTRAL REFLECTANCE OF CHROMIUM OXIDES

[Wavelength, λ, μm; Reflectance, ρ; Temperature, T, K]

CURVE 1
T = 298

λ	ρ
0.230	0.090
0.235	0.080
0.259	0.080
0.269	0.082
0.274	0.084*
0.278	0.088
0.290	0.088
0.322	0.085*
0.326	0.080
0.340	0.080*
0.350	0.080
0.370	0.079
0.421	0.067
0.529	0.067
0.649	0.064
0.733	0.071
0.850	0.070
1.05	0.065
1.15	0.065
1.65	0.065
1.97	0.068
2.35	0.072
2.55	0.077
2.65	0.075

CURVE 2
T ~ 298

λ	ρ
0.230	0.081
0.237	0.061
0.255	0 055
0.280	0.058
0.296	0.060
0.344	0.053
0.350	0.061
0.374	0.081
0.399	0 204
0.466	0.082
0.531	0.227
0.579	0.112
0.602	0.108
0.631	0.119
0.710	0.211
0.748	0.300

CURVE 2 (cont.)

λ	ρ
0.748	0.369
0.789	0.479
0.810	0.495
0.828	0.496
0.950	0.483
1.15	0.461
1.35	0.458
1.52	0.455
1.70	0.460
1.99	0.467
2.37	0.473
2.55	0.479
2.65	0.489

CURVE 3*
T ~ 298

λ	ρ
0.230	0.081
0.238	0.061
0.256	0.056
0.280	0.059
0.295	0.055
0.350	0.053
0.381	0.072
0.412	0.186
0.464	0.091
0.481	0.100
0.529	0.242
0.598	0.122
0.719	0.250
0.805	0.477
0.821	0.488
0.844	0.489
1.08	0.461
1.25	0.448
1.65	0.440
1.85	0.447
2.27	0.459
2.51	0.461
2.65	0.473

CURVE 4
T ~ 298

λ	ρ
0.230	0.070
0.237	0.051
0.244	0.042
0.250	0.040
0.269	0.042
0.280	0.045
0.313	0.045
0.330	0.043
0.350	0.044*
0.377	0.067
0.405	0.179
0.440	0.097
0.484	0.145
0.525	0.252
0.593	0.126
0.674	0.201
0.726	0.300
0.808	0.469
0.847	0.473
1.05	0.451
1.25	0.434
1.45	0.428
1.70	0.432
2.05	0.444
2.45	0.452
2.65	0.464

CURVE 5
T ~ 298

λ	ρ
0.230	0.094
0.248	0.071
0.265	0.072
0.280	0.084
0.291	0.101
0.326	0.093
0.344	0.093
0.350	0.089
0.383	0.082
0.440	0.117
0.560	0.094
0.650	0.124
0.739	0.173
0.859	0.400

CURVE 5 (cont.)

λ	ρ
0.966	0.668
1.02	0.757
1.08	0.798
1.16	0.814
1.22	0.826
1.29	0.826
1.34	0.815
1.42	0.735
1.54	0.769
1.64	0.763
1.82	0.717
1.87	0.673
1.93	0.511
1.95	0.524
2.09	0.637
2.13	0.645
2.18	0.638
2.27	0.579
2.37	0.488
2.57	0.350
2.62	0.337*
2.65	0.337

CURVE 6*
T ~ 298

λ	ρ
0.230	0.092
0.256	0.067
0.287	0 089
0.299	0.098
0.307	0.093
0.346	0.092
0.350	0.082
0.368	0.077
0.436	0.117
0.570	0.095
0.673	0.134
0.772	0.209
0.876	0.426
0.985	0.668
1.04	0.762
1.19	0.804
1.32	0.810
1.38	0.778
1.42	0.707

CURVE 6 (cont.)*

λ	ρ
1.44	0.700
1.45	0.709
1.48	0.735
1.52	0.747
1.59	0.752
1.67	0.746
1.80	0.699
1.85	0.678
1.92	0.469
1.94	0.460
1.96	0.468
2.09	0.596
2.14	0.599
2.20	0.595
2.26	0.558
2.33	0.493
2.44	0.400
2.61	0.290
2.65	0.283

CURVE 7
T ~ 298

λ	ρ
0.230	0.090*
0.254	0.064
0.277	0.071
0.294	0.089
0.309	0.093
0.347	0.090*
0.366	0.077
0.415	0.104
0.429	0.108
0.452	0.106
0.537	0.090
0.692	0.130
0.753	0.180
0.922	0.500
0.991	0.599
1.07	0.647
1.19	0.661
1.32	0.660
1.37	0.638
1.39	0.610
1.42	0.588
1.51	0.615

CURVE 7 (cont.)

λ	ρ
1.59	0.621
1.74	0.601
1.84	0.573
1.88	0.540
1.92	0.410
1.94	0.400
2.04	0.489
2.11	0.517
2.15	0.520
2.20	0.512
2.40	0.399
2.51	0.309
2.61	0.270
2.65	0.266

*Not shown on plot