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ภาคผนวก

ภาคผนวก

การ์ดมาตราฐาน JCPDS

29-1131 Wavelength= 1.54184

α-SiC

Silicon Carbide

Moissanite-6H, syn

Rad.: CuKa1 1.5405 Filter: d-sp: Debye-Sheerrer

Cut off: Int.: Film: I/Icor.:

Ref: Hanmarn, Shaffer, J. Appl. Crystallogr., 2, 45 (1969)

Sys: Hexagonal S.G.: P63mc (186)

a: 3.073 b: c: 15.08 A: C: 4.9073

α: β: γ: Z: 6 mp:

Ref: Thibault, N., Am. Mineral., 29, 327 (1944)

Dx: 3.239 Dm: 3.218 SS/FOM31=13(.0186, 73)

εα: nωβ: 2.648(1)εγ: 2.691(2)Sign= 2V:

Ref: Ibid.

Color: Yellow, black
CAS #: 409-21-2 I/I1 corrected for tungsten carbide contamination. C Si type. Wurtzite group, moissanite subgroup. PSC: hP12. To replace 22-1273 and validated by calculated patterns 29-1128 and 31-1232. Mwt: 40.10. Volume[CD]: 123.33.

d Å	Int	h	k	l
2.62100	40	1	0	1
2.51100	100	1	0	2
2.35200	20	1	0	3
2.17400	10	1	0	4
1.53700	35	1	1	0
1.41800	15	1	0	9
1.31100	40	1	1	6
1.28600	15	2	0	3
1.25600	7	0	0	12
1.08700	15	2	0	8
1.04200	7	2	0	9
1.00400	15	2	1	1
.972700	15	1	1	12
.887600	15	2	1	8
.862400	7	2	1	9
.837000	9	2	1	10
.802100	9	2	0	15

10-0173 Wavelength= 1.5405

Al2O3

Aluminum Oxide

Corundum, syn

Rad.: CuKa1: 1.5405 Filter: Ni Beta d-sp:

Cut off: Int.: Diffract. I/Icor.: 1.00

Ref: Natl. Bur. Stand. (U.S.), Circ. 539, 9, 3 (1960)

Sys.: Rhombohedral S.G.: R3c (167)

a: 4.758 b: c: 12.991 A: C: 2.7303

α: β: γ: Z: 6 mp: 2050

Ref: Ibid.

Dx: 3.989 Dm: 4.050 SS/FOM30=50(.0188, 32)

εα: 1.7604 nωβ: 1.7686 εγ: Sign= 2V:

Ref: Dana's System of Mineralogy, 7th Ed., I, 520

Color: Blue, colorless, yellow
Pattern taken at 26 C. Sample annealed at 1400 C for four hours in an Al2 O3 crucible. Spectroscopic analysis showed <0.1% K, Na, Si; <0.01% Ca, Cu, Fe, Mg, Pb; <0.001% B, Cr, Li, Mn, Ni. Also called: ruby. Also called: sapphire. Al2 O3 type. Corundum group, corundum subgroup. Also called: alumina. Also called: diamonite. PSC: hR10. Mwt: 101.96. Volume[CD]: 254.70.

d Å	Int	h	k	l	d Å	Int	h	k	l
3.47900	75	0	1	2	.934500	4	3	1	8
2.55200	90	1	0	4	.917800	4	2	2	9
2.37900	40	1	1	0	.907600	14	3	2	4
2.16500	<1	0	0	6	.905200	4	0	1	14
2.08500	100	1	1	3	.899100	8	4	1	0
1.96400	2	2	0	2	.888400	<1	2	3	5
1.74000	45	0	2	4	.880400	4	4	1	3
1.60100	80	1	1	6	.869800	2	0	4	8
1.54600	4	2	1	1	.858000	12	1	3	10
1.51400	6	1	2	2	.850200	4	3	0	12
1.51000	8	0	1	8	.846000	4	2	0	14
1.40400	30	2	1	4	.830300	22	1	4	6
1.37400	50	3	0	0	.815700	4	1	1	15
1.33700	2	1	2	5	.807200	11	4	0	10
1.27600	4	2	0	8	.798800	7	0	5	4
1.23900	16	1	0	10	.797000	14	1	0	16
1.23430	8	1	1	9	.793100	13	3	3	0
1.18980	8	2	2	0					
1.16000	<1	3	0	6					
1.14700	6	2	2	3					
1.13820	2	1	3	1					
1.12550	6	3	1	2					
1.12460	4	1	2	8					
1.09880	8	0	2	10					
1.08310	4	0	0	12					
1.07810	8	1	3	4					
1.04260	14	2	2	6					
1.01750	2	0	4	2					
.997600	12	2	1	10					
.985700	<1	1	1	12					
.981900	4	4	0	4					
.943100	<1	3	2	1					
.941300	<1	1	2	11					

41-1105 — Wavelength= 1.540598

Y2O3

Yttrium Oxide

Rad.: CuKa1: 1.5405 Filter: Graph Monod-sp: Diffractometer

Cut off: 15.0 Int.: Diffract. I/Icor.: 9.1

Ref: Martin, K., McCarthy, G., North Dakota State University, Fargo, North Dakota, USA, ICDD Grant-in-Aid, (1989)

Sys.: Cubic S.G.: Ia3 (206)

a: 10.6041(5)b: c: A: C:

α: β: γ: Z: 16 mp: 2440

Ref: Ibid.

Dx: 5.031 Dm: SS/FOM$_{31}$=160(.0060, 31)

Color: White

Peak height intensity. Sample obtained from Research Chemicals, Phoenix, Arizona, USA. Annealed for 48 hours at 1200 C. Average relative standard deviation in intensity of the ten strongest reflections for three specimen mounts = 2%. Validated by a calculated pattern. Dixbyite, Mn2 O3 type. Also called: yttria.Silicon used as an internal stand. Single-crystal data used. PSC: cI80. To replace 25-1200. Mwt: 225.81. Volume[CD]: 1192.40.

d Å	Int	h	k	l	d Å	Int	h	k	l
5.3070(	<1	2	0	0	1.24960	1	6	6	0
4.3300(	13	2	1	1	1.23270	3	8	3	1
3.0610	100	2	2	2	1.21630	6	6	6	2
2.8350(	<1	3	2	1	1.2007(	<1	7	5	2
2.6510(	24	4	0	0	1.18560	4	8	4	0
2.49900	5	4	1	1	1.17110	1	8	3	3
2.37150	1	4	2	0	1.15700	1	8	4	2
2.26050	6	3	3	2	1.14350	2	9	2	1
2.16450	1	4	2	2	1.1305(	<1	6	6	4
2.07880	8	4	3	1	1.11780	2	8	5	1
1.93570	2	5	2	1	1.09380	2	9	3	2
1.8740(	39	4	4	0	1.08230	4	8	4	4
1.81830	2	4	3	3	1.07120	2	9	4	1
1.7677(	<1	6	0	0	1.06040	1	10	0	0
1.72000	5	6	1	1	1.05000	1	10	1	1
1.67670	1	6	2	0	1.03990	3	10	2	0
1.63610	4	5	4	1	1.03000	1	9	4	3
1.5984(	25	6	2	2	1.02040	3	10	2	2
1.56330	5	6	3	1	1.01110	2	10	3	1
1.53040	4	4	4	4	.993200	2	8	7	1
1.49950	2	5	4	3	.984500	2	10	4	0
1.47050	1	6	4	0	.976200	1	10	3	3
1.44300	3	7	2	1	.968000	2	10	4	2
1.41700	1	6	4	2	.960100	1	9	5	4
1.34670	2	6	5	1	.944800	2	11	2	1
1.32550	4	8	0	0	.937400	1	8	8	0
1.30520	3	8	1	1	.923100	1	10	4	4
1.28590	2	8	2	0	.916000	1	11	3	2
1.26740	2	6	5	3	.909300	1	10	6	0

d Å	Int	h	k	l
.902700	1	11	4	1
.896300	2	10	6	2
.88970(	<1	9	6	5

33-0040 — Wavelength= 1.540598

Al5Y3O12

Aluminum Yttrium Oxide

Rad.: CuKa1: 1.5405 Filter: Mono d-sp: Diffractometer

Cut off: Int.: Diffract. I/Icor.:

Ref: Natl. Bur. Stand. (U.S.) Monogr. 25, 19, 11 (1982)

Sys.: Cubic S.G.: Ia3d (230)

a: 12.0089(3)b: c: A: C:

α: β: γ: Z: 8 mp

Ref: Ibid.

Dx: 4.553 Dm: SS/FOM$_{31}$=89(.0112, 30)

Color: White

Pattern at 25 C. The sample was prepared at NBS, Gaithersburg, Maryland, USA. CAS #: 12005-21-9. Stoichiometric amounts of the constituent oxides were blended and calcined at 1650 C for two hours. After grinding, the resultant product was placed in an iridium crucible, fused in an induction heater and several single-crystal boules grown using the Czochralski technique. Silicon used as an internal stand. PSC: cI160. To replace 8-178, 30-51. Mwt: 593.62. Volume[CD]: 1731.85.

d Å	Int	h	k	l	d Å	Int	h	k	l
4.9050(	27	2	1	1	1.26560	1	8	5	1
4.24700	7	2	2	0	1.23880	2	9	3	2
3.2100(	19	3	2	1	1.2257(	<1	8	4	4
3.0020(	27	4	0	0	1.2128(	<1	9	4	1
2.6870	100	4	2	0	1.2011(	<1	8	6	0
2.5610(	<1	3	3	2	1.1889(	<1	10	1	1
2.4520(	20	4	2	2	1.17760	2	10	2	0
2.35500	6	4	3	1	1.1665(	<1	9	4	3
2.1920(	23	5	2	1	1.14510	3	10	3	1
2.12200	5	4	4	0	1.1249(	<1	8	7	1
1.9474(	26	5	3	2	1.1151(	14	10	4	0
1.8994(	<1	6	2	0	1.10560	2	9	6	1
1.8536(	<1	5	4	1	1.09640	6	10	4	2
1.77050	2	6	3	1	1.0874(	<1	9	5	4
1.7330(	17	4	4	4	1.06980	3	10	5	1
1.6988(	<1	5	4	3	1.06160	6	8	8	0
1.6652(	31	6	4	0	1.03730	2	9	7	2
1.63380	9	7	2	1	1.02980	1	10	6	0
1.6046(	28	6	4	2	1.0223(	<1	11	4	1
1.52470	4	6	5	1	1.0150(	<1	10	6	2
1.5006(	10	8	0	0	1.0077(	<1	9	6	5
1.4780(	<1	7	4	1	1.00070	1	12	0	0
1.4561(	<1	8	2	0	.993900	<1	9	7	4
1.43520	1	6	5	3	.987200	3	12	2	0
1.41570	1	6	6	0	.980500	2	11	5	2
1.3962(	<1	7	4	3	.974100	6	10	6	4
1.3598(	<1	7	5	2	.96760(	<1	12	3	1
1.34230	7	8	4	0					
1.3102(	17	8	4	2					
1.29490	2	7	6	1					
1.28000	6	6	6	4					

ประวัติผู้เขียนวิทยานิพนธ์

นายกานต์ เสรีวัลย์สถิตย์ เกิดวันที่ 14 กรกฎาคม พ.ศ. 2521 ที่กรุงเทพมหานคร สำเร็จการศึกษาปริญญาตรี วิทยาศาสตรบัณฑิตจาก ภาควิชาวัสดุศาสตร์ คณะวิทยาศาสตร์ เมื่อปีการศึกษา 2542 และได้เข้าศึกษาต่อในหลักสูตรวิทยาศาสตรมหาบัณฑิต สาขาเทคโนโลยีเซรามิก จุฬาลงกรณ์มหาวิทยาลัย ในปีการศึกษา 2543 สำเร็จการศึกษาในภาคการศึกษาปลาย ปีการศึกษา 2546