

TABLE 2. X-Ray Diffraction Characteristics of Magnesium Hexaboride, Obtained from a Debye Pattern Using Ni K α Radiation

Line No.	Magnesium hexaboride (our data)		Phase of A of [2], Fe K α		Line No.	Magnesium hexaboride (our data)		Phase of A of [2], Fe K α	
	I	d, Å	I	d, Å*		I	d, Å	I	d, Å*
1	m.s	4.15	v.w	4.18	26	v.w	1.400	w	1.392
2	m.w	3.75	w	3.79	27			v.w	1.346
3	m	3.32			28	s	1.341	s	1.324
4	w	3.06	w	3.09	29	m	1.307	s	1.313
5	s	2.75	w	2.73	30	m.w	1.296	w	1.303
6	m.s	2.54	v.s	2.53	31	s	1.274	w	1.273
7	v.v.s	2.32	s	2.32	32			w	1.263
8			m	2.26	33	v.v.v.w	1.254	w	1.256
9	v.s	2.21	m	2.20	34	v.v.v.w	1.214	w	1.221
10	v.w	2.15	m	2.16	35	v.v.v.w	1.200	v.w	1.205
11	s	2.07	v.w	2.05	36	m.w	1.168	m	1.168
12			m	2.01	37	v.w	1.158	w	1.160
13	v.v.v.w	1.979	s	1.96	38	v.v.v.w	1.140	m	1.146
14	v.v.v.w	1.892	w	1.89	39	w	1.118	w	1.125
15			m	1.86	40	m	1.104	m	1.100
16	m	1.835	m	1.83	41	m.s	1.090	m	1.083
17	m	1.768	w	1.76	42	v.w	1.069	s	1.070
18	m	1.727	w	1.71	43			w	1.063
19	w	1.670	w	1.69	44			s	1.050
20	m	1.641	s	1.63	45			m	1.047
21			v.w	1.60	46	m.d	1.035	s	1.028
22	v.v.v.w	1.576	w	1.58	47	m.s	1.021	w	1.018
23	v.v.v.w	1.53	s	1.53	48	m.s	1.001		
24	v.v.w	1.454	m	1.454					
25	m.s	1.430	m						

* Calculated by us from kX in Å by multiplying by 1.00202.

Notation: v.v.s., very very strong; v.s., very strong; s., strong; m.s., medium strong; m., medium; m.d., medium diffused; m.w., medium weak; v.w., very weak; v.v.w., very very weak; v.v.v.w., very very very weak.

TABLE 3. Some Properties of Magnesium Boride, Prepared under Superhigh-Pressure Conditions

Properties	Magnesium diboride	Magnesium hexaboride
Chemical composition	53% Mg, 47% B	27.4-26.6% Mg; 72.6-73.4% B
Syngony	Hexagonal	Rhombic
Crystal habit	Lamellar	Isometric
Color	Goldish-yellow	Light-green
Degree of transparency	Nontransparent	Transparent
Luster	Metallic	Diamond-like
Light refraction N_m	Not determined	2.8
In polished section:		
Color	Goldish-yellow	White
Reflectivity	High	High
Bireflection	High; coloration; ϵ , orange-gold; ω , pinkish	Low
Color anisotropy effect	In bright-azure and yellowish tints	Is not present
Microhardness H_v , kg/mm ²	1260	3500
Chemical stability	Soluble in acidic and alkali solutions	Insoluble in acidic and alkali solutions Is oxidized by water vapor at 800°C with the formation of 3 MgO • B ₂ O ₃ , pseudomorphically replacing MgB ₆ grains