

substance: boron compounds with group V elements
property: properties of boron-niobium compounds

Nb₃B₂

Preparation [75S]

High temperature thermodynamic properties in [86B].

NbB

Preparation [75S, 77L], electronic structure [76S]

Shock-induced reaction synthesis in [91G].

Structure: orthorhombic

Space group: Cmc₂m

Crystal growth and structure determination in [91O].

lattice parameters

(in Å)

<i>a</i>	3.2961(6)	<i>T</i> = 300 K	X-ray diffraction	91O
<i>b</i>	8.7224(8)			
<i>c</i>	3.1653(4)			
<i>V</i>	91.00(2) Å ³			

density

<i>d</i>	7.570(2) g cm ⁻³	X-ray	91O
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High temperature thermodynamic properties in [86B].

Nb₅B₆

Structure: orthorhombic

Space group: Cmmm

Crystal growth and structure determination in [91O].

lattice parameters

(in Å)

<i>a</i>	3.1567(2)	<i>T</i> = 300 K	X-ray diffraction	91O
<i>b</i>	22.767(2)			
<i>c</i>	3.3034(3)			
<i>V</i>	237.11(2) Å ³			
<i>a</i>	22.768(2)	<i>T</i> = 300 K	X-ray diffraction	90B
<i>b</i>	3.1539(2)			
<i>c</i>	3.2992(3)			
<i>V</i>	236.91 Å ³			

density

<i>d</i>	7.415(3) g cm ⁻³	X-ray diffraction	91O
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Nb₃B₄

Preparation [75S, 77L]

Structure: orthorhombic

Space group: Imcm

Crystal growth and structure determination in [91O].

lattice parameters

(in Å)

<i>a</i>	3.3033(3)	<i>T</i> = 300 K	X-ray diffraction	91O
<i>b</i>	14.076(1)			
<i>c</i>	3.1428(3)			
<i>V</i>	146.13(2) Å ³			

density

<i>d</i>	7.317(2) g cm ⁻³	X-ray diffraction	91O
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High temperature thermodynamic properties in [86B].

Nb₂B₃

Structure: orthorhombic

Space group: Cmcm

Crystal growth and structure determination in [91O].

lattice parameters

(in Å)

<i>a</i>	3.3058(6)	<i>T</i> = 300 K	X-ray diffraction	91O
<i>b</i>	19.481(4)			
<i>c</i>	3.1293(8)			
<i>V</i>	201.53(8) Å ³			

density

<i>d</i>	7.193(4) g cm ⁻³	X-ray diffraction	91O
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NbB₂

Metallic; preparation [75S, 77L], crystalline structure [81N], electronic structure [76S, 79P], electronic transport, thermal properties [77C]

Structure: hexagonal

Space group: P6/mmm

Crystal growth and structure determination in [91O].

Growth and crystal data for preparation by high temperature solution growth in [84L1] and in the references therein.

Synthesis by solid state reaction [87I].

Preparation by hot-pressing [87M].

lattice parameters

(in Å)

a	3.1115(2)...3.1037(1)	$T = 300$ K	X-ray diffraction	91O
c	3.2657(3)...3.3237(1)			
V	27.38(3)...27.73(1)	Å ³		

Pressure dependence of the superconducting transition temperature in single-crystal NbB_x (x near 2) with $T_c = 9.4$ K [92S].

On superconductivity in NbB₂ (compared with MoB₂) and NbB_{2±x} (highest $T_c = 9.6$ K) see [94K].

High temperature thermodynamic properties in [86B].

Defect structure in of NbB₂ (and VB₂) single crystals [81N].

Irradiation-induced damage rates in [95C].

density

d	6.945(3)...6.858(2)	g cm ⁻³	X-ray diffraction	91O
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thermal expansion coefficient

α	10.0(5)·10 ⁻⁶ K ⁻¹	$T = 300...923$ K	c axis, X-ray diffraction	88L
	6.2(5)·10 ⁻⁶ K ⁻¹		a axis	

Within the homogeneity range the expansion coefficients are largely independent of the composition [88L].

A study of the thermal expansion of samples within the homogeneity ranges of NbB₂ and TaB₂ [87L].

microhardness

H_V	17.9...19.2	GN m ⁻²	$T = 300$ K	increase within the homogeneity range	84L2
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Nb₂B₅**critical temperature of superconductivity**

T_c	6.4	K		91F, 70C
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Nb₄B₃C₂

Synthesis and crystal structure [99H].

Space group: Cmcm

lattice parameters

(in Å)

a	3.2287(2)	$T = 300$ K	X-ray diffraction	99H
b	37.544(11)			
c	3.1331(7)			

Nb₃Co₄B₇

lattice parameters

<i>a</i>	3.202(1) dimension is missing	$T = 300\text{ K}$	86K
<i>b</i>	18.432(5)		
<i>c</i>	8.917(2)		

ternary NbBN system

for phase diagram, preparation and structures see [87R, 88R].

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