substance: boron compounds with group VI elements
property: properties of boron-selenium compounds

$B_{13}Se$

Structure formula $B_{12}Se_{2-x}B_x$

α-rhombohedral boron structure group

Space group: $R\bar{3}m$

lattice parameters

a	5.9041(4) Å	*T* = 300 K	X-ray diffraction	93B
c	11.947(1) Å			
c/*a*	2.02			

hexagonal position parameters and occupancies

Atom	Position	Coordinates	*x*	*z*	Occupancy	
B(1)	18(h)	$x, \bar{x}, z$	0.1707(2)	0.6370(3)	1.0	93B
B(2)	18(h)	*x*,*x*,*z*	0.1059(3)	0.8828(2)	1.0	
B(3)	6(c)	0,0,*z*	0.382(1)	0.531(2)		
Se	6(c)	0,0,*z*	0.4192(1)	0.469(2)		

B_2Se_3

Structure

crystalline structure: monoclinic [72H2, 77G]

space group: P_2P_m (?) or $C_{2h}{}^1$ – P2/m [77G]

lattice parameters

a	4.06(1) Å	*T* = 300 K	X-ray diffraction	72H2
b	38.6(1) Å			
c	10.43(2) Å			
β	90°			

Physical properties

No detailed investigations on the electronic properties are available. But the obtained materials, either in crystalline or glassy form are reported to be colored in red, orange or yellow [62H, 67C, 70G, 71D, 72D, 72H1, 77G]. Therefore semiconducting behavior can be expected.

IR spectra absorption maxima wavenumbers

B_2Se_3 (polycrystal)

(*v*/*c*)	768 cm^{-1}	*T* = 300 K	IR absorption	72H2,
	789 cm^{-1}			77G
	804 cm^{-1}			
	831 cm^{-1}			
	868 cm^{-1}			
	883 cm^{-1}			

B_2Se_3 (glass)

(*v*/*c*)	775 cm^{-1}	*T* = 300 K	IR absorption	72H2,
	838 cm^{-1}			77G
	861 cm^{-1}			

Deviating results on IR spectra are reported in [62H].

density

d	2·10 g cm^{-3}	calculated	77G

melting point

T_m	753 K		69B,
			72H2

glass softening temperature

T_{gs}	325ºC	beginning of glass softening	71D, 72D

References:

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