

substance: boron compounds with group VII elements
property: properties of boron-manganese compounds

Mn₄B

Preparation [75S, 77L], crystalline structure [81T], magnetic properties [77B], X-ray photoelectron spectra [79A]

In [81T] composition determined to be Mn₂B.

Mn₂B

Preparation [75S, 77L], crystalline structure [81T], magnetic properties [77B], X-ray photoelectron spectra [79A]

Two phases, tetragonal and orthorhombic, form directly from arc melts. No transformation between them was observed [81T].

Structure: orthorhombic

Space group: Fddd

lattice parameters

(in Å)

| | | | | |
|----------|------------|------------------|-------------------|-----|
| <i>a</i> | 14.5395(8) | <i>T</i> = 300 K | X-ray diffraction | 81T |
| <i>b</i> | 7.2914(11) | | | |
| <i>c</i> | 4.2082(3) | | | |

Mn₄₈B₄₂

On preparation of amorphous material, see [87M].

Frequency dependence of the ESR linewidth of the resonance line in the amorphous spin glass alloy in Fig. 1 [87M].

Variation of the resonance ESR linewidth with temperature at various frequencies in Fig. 2 [87M].

MnB

Preparation [75S, 77L], electronic structure [81A2], magnetic properties [77B], X-ray photoelectron spectra [79A]

Mn₃B₄

Preparation [75S, 77L], magnetic properties [77B], X-ray photoelectron spectra [79A]

MnB₂

Metallic?; preparation [75S, 77L], electronic structure [81A2], magnetic properties [77B], X-ray photoelectron spectra [79A], electronic and thermal properties [77C]

MnB₄

Preparation [75S, 77L], crystalline structure [77L], magnetic properties [77B]

MnB₂₃

Semiconducting?; preparation [74A, 70A], crystalline structure [77N, 70A, 73A, 82L], hardness [70C]

References:

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77C Castaing, J., Costa, P.: see [77B], p. 390.
77L Lundström, T.: see [77B], p. 351.
77N Naslain, R.: see [77B], p. 139.
79A Aleshin, V. G., Kosolapova, T. Ya., Nemoshkalenko, V. V., Serebryakova, T. I., Chudimov, N. G.: J. Less Common Met. 67 (1979)
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81A2 Armstrong, D. R., Bolland, J., Perkins, P. G. (abstract only): [81A], p. 358.
81T Tergenius, L.E.: J. Less-Common Met. 82 (1981) 335 (Proc. 7th Int. Symp. Boron, Borides and Rel. Compounds, Uppsala, Sweden, 1981).
82L Lundström, T.: The Formation of the Bonds to the Group IIIb Elements in Inorganic Reactions and Methods, (Ed.: J. J. Zuckerman) Verlag Chemie: Weinheim, 1982.
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Fig. 1.

a-Mn₄₈B₅₂. ESR linewidth vs. frequency [87M]. Relation: spin resonance linewidth $\Gamma = \Gamma_0 + \Gamma_1 (T/T_0)^n \exp(-T/T_0)$; Γ_0 , temperature-independent part.

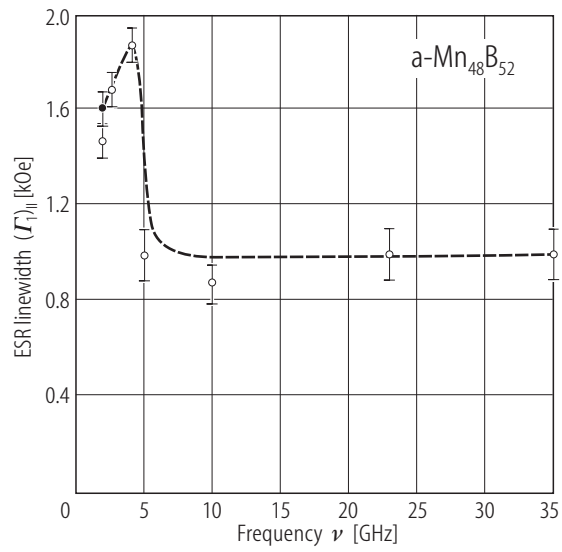


Fig. 2.

a-Mn₄₈B₅₂. Resonance linewidth vs. temperature for various frequencies (2...35 GHz). For the points at 9 GHz, the temperature independent component Γ_0 and deviations from it at high ($\Delta\Gamma_H$) and low ($\Delta\Gamma_L$) temperatures are shown. The value T_{SG} obtained from static measurements is shown by the arrow [87M].

