

substance: boron compounds with group III elements
property: properties of Al-C-B compounds

AlC₂B₁₂

preparation [66L], crystalline structure [77M1, 77M2]

AlC₄B₂₄...26

preparation [79S], crystalline structure [70W, 77M1, 77M2]

AlC₄B₄₀

preparation [61M], crystalline structure [77M2]

AlC₄B₂₄

Compound related to AlB₁₀ [91P].

Preparation of AlC₄B₂₄ (and Al₃C₂B₄₈) crystals in [90O].

Structure: orthorhombic

Space group: Bb2₁m

lattice parameters

(in Å)

<i>a</i>	8.892(2)	<i>T</i> = 300 K	oscillation Weissenberg and precession photography	90O
<i>b</i>	9.112(1)			
<i>c</i>	5.692(2)			

ESR

<i>g</i>	2.0025	<i>T</i> = 300 K		91P
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ESR spectra at 77 and 300 K in Fig. 1 [91P].

activation energies

(in eV)

<i>E_A</i>	0.18	<i>T</i> = 110...119 K	electrical conductivity	91P
	0.28	<i>T</i> = 119...238 K		
	0.075	<i>T</i> = 238...435 K		

electrical conductivity

<i>σ</i>	5·10 ⁻⁸ Ω ⁻¹ cm ⁻¹	<i>T</i> = 293 K		91P
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optical properties

Phonon spectra in Fig. 2 [91P].

microhardness (AlC₄B₂₄)

<i>H_K</i>	24.2(7) GPa	<i>T</i> = 300 K		91P, 87K
	2500...2690 kg mm ⁻²			90O

density

<i>d</i>	2.55(1) g cm ⁻³	<i>T</i> = 300 K	floatation method	90O
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fracture toughness

<i>K_c</i>	2.7(2)	MN m ^{-3/2}		91P, 87K
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References:

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Fig. 1.

$\text{AlC}_4\text{B}_{24}$. EPR spectra at **(a)** 300 K for three different crystal orientations relative to the magnetic field, **(b)** 77 K [91P].

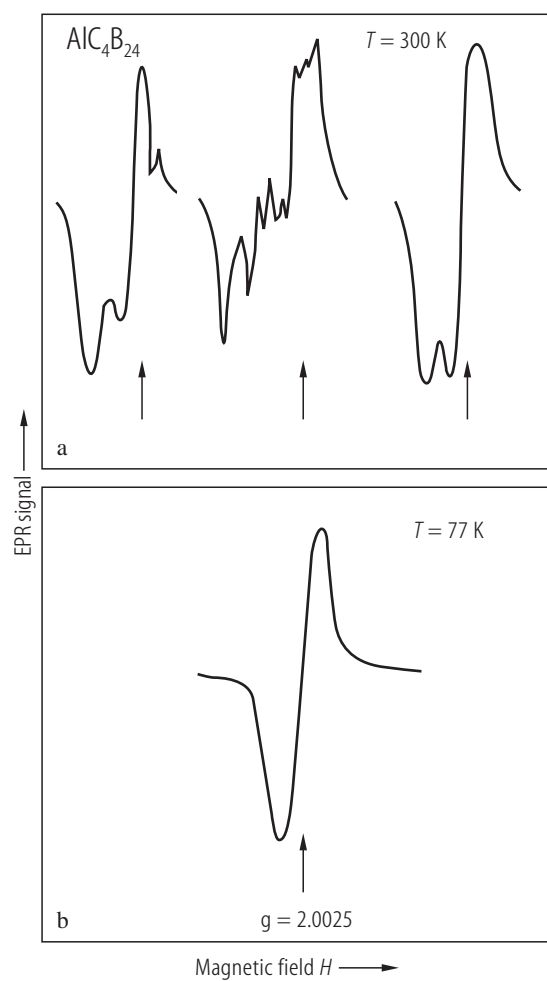


Fig. 2.

$\text{AlC}_4\text{B}_{24}$. IR absorption spectra of three different samples [91P].

