substance: boron compounds with group IV elements: boron carbide
property: amorphous boron carbide

Preparation

Formation of B_xC_{1-x} films by a toroidal glow discharge [87T].

synchrotron-radiation-induced deposition of boron and boron carbide films from boranes and carboranes in [92P].

Deposition and characterization of thin boron-carbide coatings [93K3].

CVD of boron carbide from BBr_3-CH_4-H_2 mixtures into a microwave plasma [87C].

High resolution electron microscope studies of irradiation-induced crystalline-to-amorphous transition in boron carbide [90M].

Optical properties

Absorption edge of amorphous boron carbide in Fig. 1 [91K, 95H].

Infrared studies of amorphous $B_{1-x}C_x$ films [95S]. IR absorption spectra in Fig. 2, for Raman spectra see [95S].

IR study of local vibrations in hydrogenated amorphous $B_{1-x}C_x$ (and amorphous B) alloys prepared by plasma deposition; absorption due to B – H and C – H bonds in Fig. 3 [90S].

IR studies in particular of the B-H vibration in amorphous $B_{1-x}C_x$ films in [91S].

IR and Raman spectra of a-$B_{1-x}C_x$ films in [94S].

Raman spectrum of a-B_9C showing a broad hardly structured Raman band between about 200 and 1200 cm^{-1} similar to that for x_g = 50% in [94S] in [80L].

Further properties

Speed of sound variation of a-B_9C in Fig. 4 [98M].

Corrosion resistance of boron carbide in liquid sodium [94B].

Properties of hydrogenated a-BC:H films in [91S].

Differential thermal analysis and thermal gravimetry in Fig. 5 [93K2].

Crystallization of B-C amorphous phases in [93K4].

Behavior of hot-pressed boron carbide at high temperatures. II. Strength [89G].

References:

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Fig. 1.

Amorphous boron carbide (~$B_{4.3}C$). Absorption edge. $(\alpha h\nu)^{1/3}$ vs. photon energy [91K, 95H].

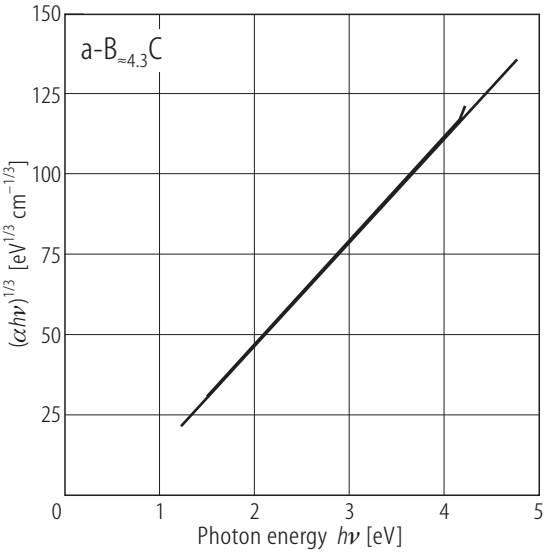

Fig. 2.

Amorphous boron carbide. IR absorption spectra of plasma-deposited a-$B_{1-x}C_x$:H films for various C contents in the gas phase x_g = 0, 20, 50 and 70 % C [95S].

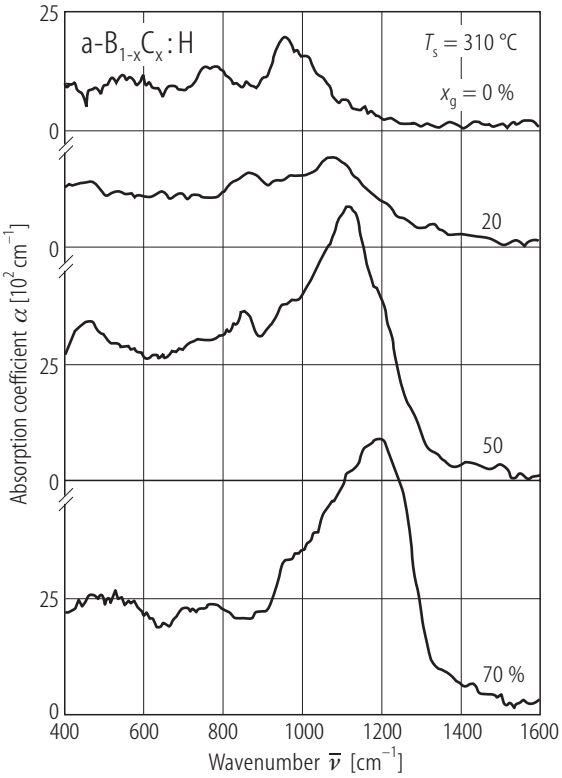

Fig. 3.

Amorphous boron carbide. Absorption coefficient vs. wavenumber; **(a)** absorption due to the B-H bonds for various C contents in the gas phase (x_g = 0, 24, 50 and 70 %C), **(b)** absorption due to the C-H bond for x_g = 40 and 70 % C [90S].

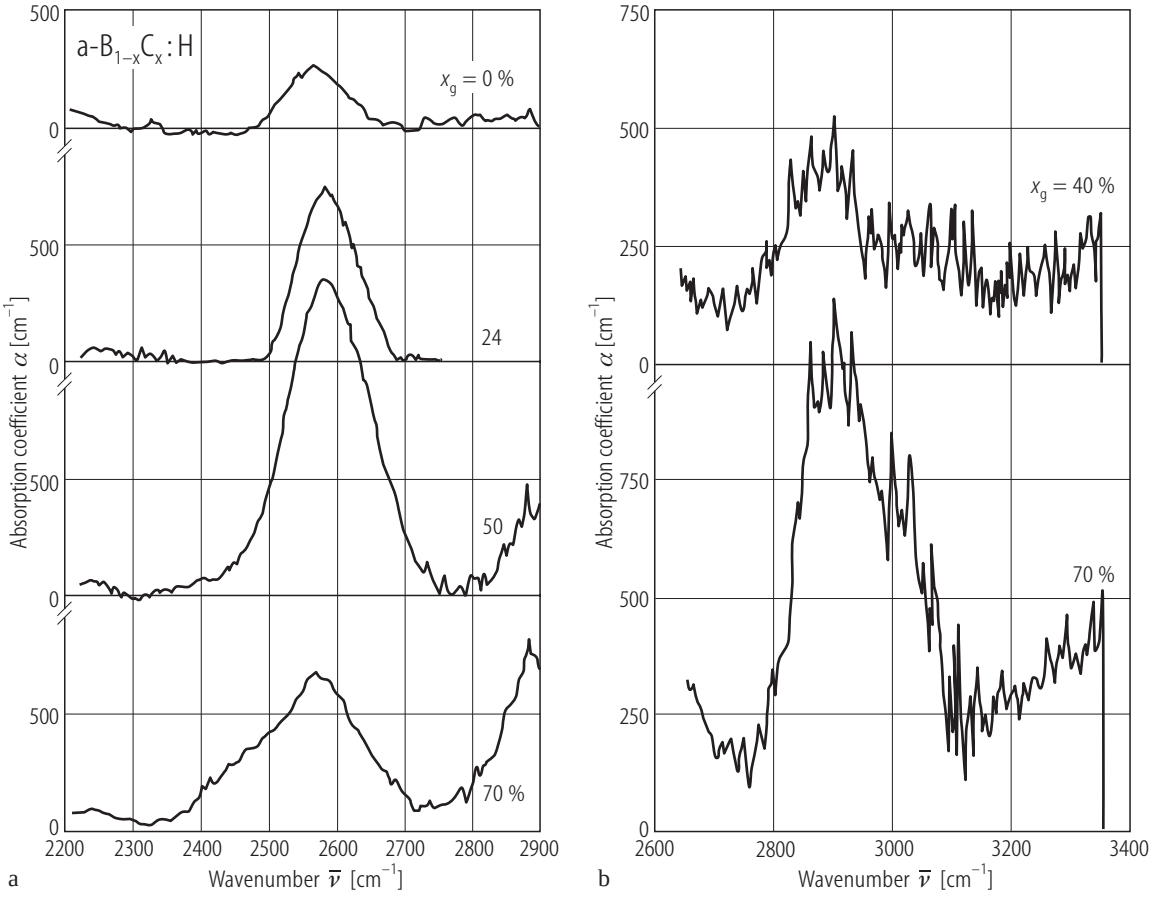

Fig. 4.

Boron carbide. Speed of sound variation vs. temperature. Full triangles, cryst. B_4C, open squares, cryst $B_{13}C_2$, full circles, cryst B_9C compared with (open circles) amorphous B_9C and (open triangles) β-rhombohedral boron; (———) tunneling model fit [98M].

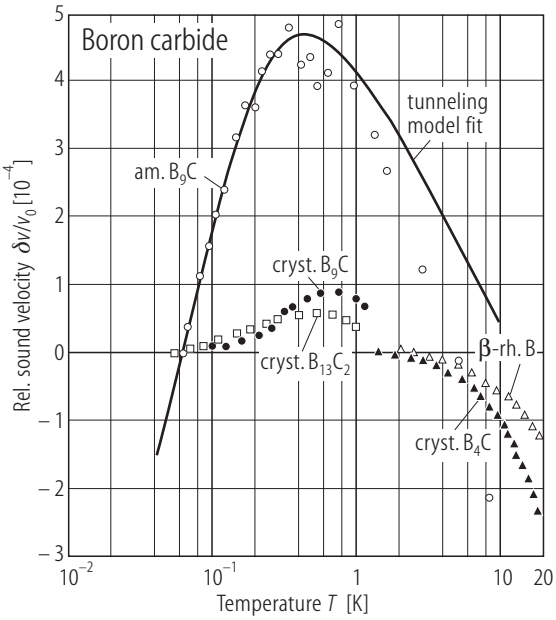

Fig. 5.

Amorphous boron carbide. Differential thermal analysis (DTA) and thermal gravimetry vs. temperature [93K1].