

**substance: boron compounds with group IV elements: boron carbide**

**property: impurities and defects**

**deformation of B<sub>11</sub>C icosahedra**

The C atom substituting for B in a polar site of the icosahedron is shifted compared with the B atom towards the center of the icosahedron by  $\Delta r$

$\Delta r$	0.09 Å	$T = 300$ K	calculated	87H1, 87H2
	0.115 Å		experimental	94W
$\Delta r/r$	~0.1		X-ray diffraction on B <sub>10</sub> C <sub>2</sub> H <sub>12</sub>	71B

**neutron irradiated boron carbide**

X-ray diffraction spectra and positions of (hkl) lines of initial and irradiated carbothermal B<sub>4</sub>C in Fig. 1 [94G].

**variation of unit cell parameters during neutron irradiation**

$\Delta a$	– 0.07 %	$T_{\text{irradiation}} = 550$ K	magnesiothermal preparation, B <sub>4</sub> C assumed	94G
$\Delta c$	– 1.12 %			
$\Delta V$	–1.26 %			
$\Delta a$	0.08 %	$T_{\text{irradiation}} = 570$ K	carbothermal preparation, B <sub>4</sub> C assumed	94G
$\Delta c$	– 0.95 %			
$\Delta V$	– 0.78 %			
$\Delta a$	0.23 %	$T_{\text{irradiation}} = 550$ K	hot pressed mixture of carbo- thermal B <sub>4</sub> C powder and B powder, B <sub>9</sub> C assumed	94G
$\Delta c$	– 1.28 %			
$\Delta V$	– 0.83 %			

Thermal conductivity of initial and neutron irradiated boron carbide in Fig. 2 [94G, 85G].

Swelling of pellets and lattice by neutron irradiation in [94G].

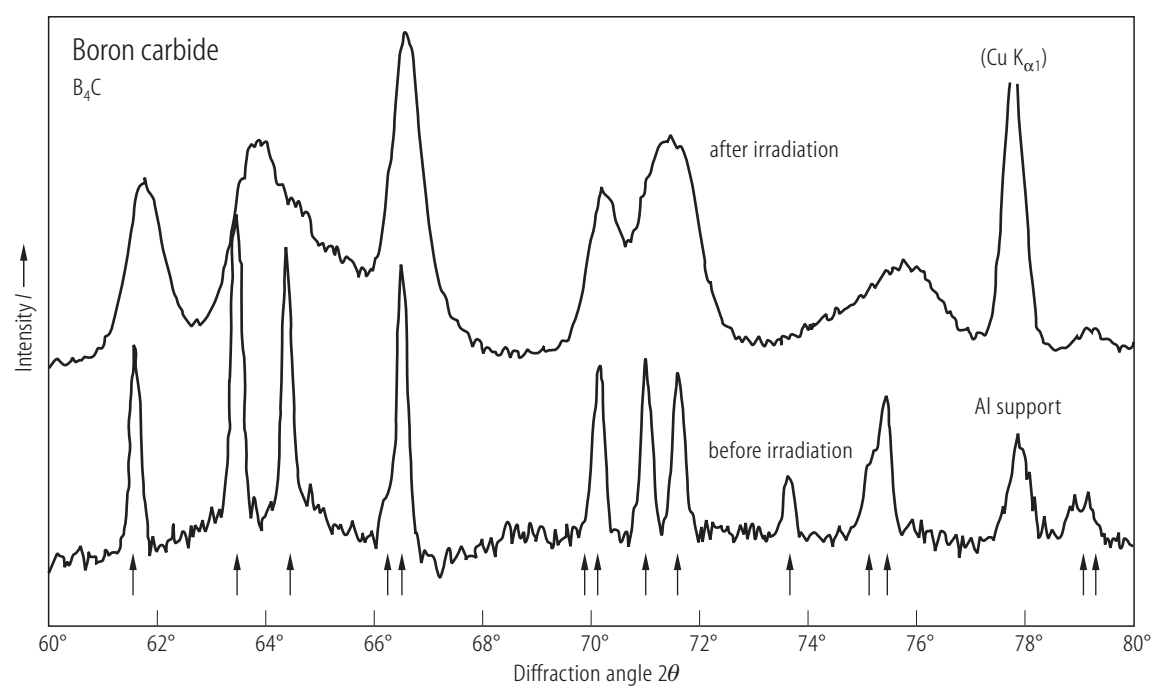
The role of free carbon in the transport and magnetic properties of boron carbide [85B]. Comment to this paper [85W]; reply to the comment [85Z].

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**Fig. 1.**

Boron carbide ( $B_4C$ ). X-ray diffraction spectra and positions of (hkl) lines of initial and neutron irradiated carbothermal  $B_4C$  [94G].



**Fig. 2.**

Boron carbide ( $B_4C$ ,  $B_9C$ ). Thermal conductivity of initial and neutron irradiated boron carbide vs.  $T$ . Carboth.  $B_4C$ , (—■—) initial, (·····) irradiated; magnes.  $B_4C$ , (—□—) initial, (——) irradiated;  $B_9C$ , (—◆—) initial, (—·—·—) irradiated [94G];  $B_4C$  (—◇—) initial, (-----) irradiated [85G].

