m.p. 144° alone or in admixture with an authentic specimen.

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The Crystal Structure of Hf_2Al_3

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In the course of phase analyses and crystal structure determinations in the binary metal systems hafnium-aluminium [1-3] and zirconium-aluminium [1], a phase with the composition Hf_2Al_3 has been studied.

The structure has been determined from complete single crystal data using Patterson and electron density maps. The alloy was prepared by arc-melting and single crystals could be obtained from the crushed melt. The single crystal and Guinier powder data showed the structure to be orthorhombic with the following unit cell dimensions:

$a = 9.52_3$ Å $b = 13.76_3$ Å $c = 5.52_2$ Å

The following structure was derived:

Unit cell content: 8 Hf_2Al_3 (observed density 8.00, calculated density 8.04).

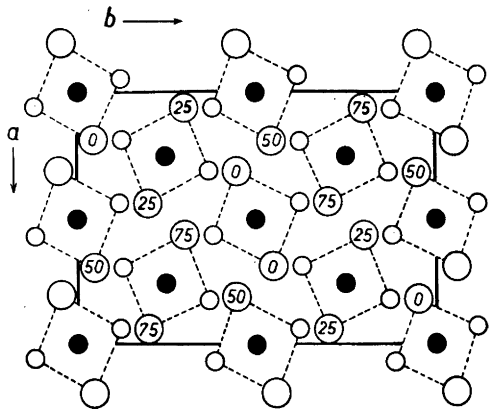

Fig. 1. The structure of Hf_2Al_3 seen along the *c*-axis. The figures in the large circles indicate the height of the Hf-atoms in percent of *c*. Small open circles: Al at *c*/4 above the Hf atoms in the pyramid. Small black circles: Al at 0.39 *c* below the Hf atoms in the pyramid.

Space-group: *Fdd*2 (No. 43).

16 Hf in 16(*b*): $x = 0.185$ $y = 0.052$ $z = 0.000$
16 Al in 16(*b*): $x = 0.185$ $y = 0.133$ $z = 0.500$
8 Al in 8(*a*): $x = 0$ $y = 0$ $z = 0.61$

The structure may be described as built up by triangular-bipyramids, Hf_2Al_3, with the hafnium-atoms forming the apices of the pyramids (*cf.* Fig. 1).

An examination of the zirconium-aluminium system shows the existence of an isotypic structure Zr_2Al_3.

Full details on these investigations and a discussion of the structures in the hafnium-aluminium system will be given elsewhere.

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