

The borides of the platinum metals are closely related, and many phases crystallise in the same structure type. However, they differ structurally from the borides of the earlier transition group metals, particularly in the following two respects: first, some platinum metal borides (e.g. Pd₃B, Pd₅B₂, Ru₇B₃, Rh₇B₃) are structurally closely related to carbides while this does not apply to borides of metals in groups IVa, Va and VIa. Secondly, by comparison with the radius sum, the shortest distances between unlike atoms in platinum metal borides are, in general, considerably shorter than is the case

for borides of the earlier transition group metals. Analogous observations can be made for silicides and phosphides.

The origin of the rather marked structural differences between borides, silicides and phosphides of the platinum metals, on the one hand, and the corresponding phases of the earlier transition group metals on the other, cannot be satisfactorily explained at present. Clearly, they are not solely dependent on differences in the radius ratio, but are intimately connected with the nature of chemical bonding in these compounds.

References

- | | | |
|----|-------------------------------------|---|
| 1 | G. Reinacher | <i>Rev. mét.</i> , 1957, 54 , 321 |
| 2 | B. Aronsson | <i>Arkiv Kemi</i> , 1960, 16 , 379 |
| 3 | J. H. Buddery and A. J. E. Welch .. | <i>Nature</i> , 1951, 167 , 362 |
| 4 | B. Aronsson and J. Åselius | <i>Acta Chem. Scand.</i> (to be published) |
| 5 | M. Hansen | Constitution of Binary Alloys: McGraw-Hill, New York-Toronto-London, 1958 |
| 6 | S. Rundqvist | <i>Nature</i> , 1960, 185 , 31 |
| 7 | M. Zumbusch | <i>Z. anorg. Chem.</i> , 1940, 243 , 322 |
| 8 | S. Rundqvist and A. Hede | <i>Acta Chem. Scand.</i> , 1960, 14 , 893 |
| 9 | S. Rundqvist | <i>Acta Chem. Scand.</i> , 1961 (in print) |
| 10 | S. Rundqvist and L. O. Gullman .. | <i>Acta Chem. Scand.</i> , 1960, 14 , 2246 |
| 11 | L. Thomassen | <i>Z. physik. Chem.</i> , 1929, B4 , 277 |
| 12 | S. Rundqvist | <i>Acta Chem. Scand.</i> , 1960, 14 , 1961 |
| 13 | G. Grube and H. Speidel | <i>Z. Elektrochem. u. angew. physik. Chem.</i> , 1949, 53 , 339 |

IRIDIUM-PLATINUM WIRE FOR DIODES

The point contact diode is still widely used – particularly in domestic radio and television receivers – because it is cheaper to manufacture than the newer junction types. It is a development of the "cat's whisker" detector used in the early days of broadcasting and consists of a small dice of single crystal germanium with a fine wire or "whisker" in contact with it.

Tungsten is widely used as this material, but the metal forms a stubborn oxide film on the surface. In order to overcome this, and so achieve the required performance of the device, the General Electric Company Limited decided to use 20 per cent iridium-platinum wire for their type GEX 34 diode.

This alloy, which is used in the form of wire .004 inch in diameter, is hard enough to give the required pressure at the point of contact. In comparison with tungsten it is easier to form and the cutting and crimping tools require less maintenance. Moreover, unlike tungsten, the alloy is completely free from tarnish films.

