

Physics. — *The resistance of compounds of metals at the temperature of liquid hydrogen and liquid helium.* By W. J. DE HAAS, EDM. VAN AUBEL and J. VOOGD. (Comm. N^o. 197d from the Physical Laboratory at Leiden.)

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The investigation of the electric resistance of metal compounds described by us in a preceding communication resulted in the unexpected phenomenon of the complete disturbance of the superconductivity in the compound Cu_3Sn and in the enormously high transition point (between 4.2°K and 9°K temp. of boiling helium and solid hydrogen) of Bi_5Tl_3 (compared with that of pure Tl, 2.48°K ¹). We give here the complement of this research, namely the results of measurements of the electric resistance of the compounds Sb_2Tl_7 , AuPb_2 , Cu_4Sn . We also repeated the earlier measurements with two other rods of the compounds Cu_3Sn and Bi_5Tl_3 . These latter measurements giving the same results as the first, no further details will be given of them. The rods AuPb_2 , Sb_2Tl_7 , Cu_4Sn were made at Gent by one of us (v.A.).

The resistance measurements were made in the usual way in baths of liquid hydrogen and of liquid helium.

In the tables I, II and III the results of the measurements are to be found (R/R_0 = value of the resistance divided by the resistance at 0°C .).

AuPb_2 and Sb_2Tl_7 are found to become superconductive above the boiling point of helium (4.2°K .).

Before we can make more detailed conclusions about AuPb_2 , measurements in the temperature region between that of liquid hydrogen and that

TABLE I.
 AuPb_2 (32.03 % weight Au).

T	R/R_0
20.43	0.0331
17.46	0.0242
14.18	0.0156
4.21 765 (p helium)	0

TABLE II.
 Sb_2Tl_7 (14.7 % weight Sb).

T	R/R_0
20.43	4.4956
17.46	0.4710
14.18	0.4451
4.21 765 (p helium)	0

¹) Proc. Amsterdam Vol. 32 N^o. 2, p. 218, 1929. Leiden Comm. 193c.

TABLE III.
 Cu_4Sn (31.88 % weight Sn).

T	R/R_0
20.42	0.8325
19.07	0.8319
16.50	0.8310
14.16	0.8304
4.21 765 (p helium)	0.8288
1.35 2.20 ..	0.8288

of liquid helium must be made. For Sb_2Tl_7 and Bi_5Tl_3 too, such measurements would be of importance. With Cu_4Sn the superconductivity of the tin has completely vanished, as had already been found for Cu_3Sn .