SUPERCONDUCTIVITY OF BiNa

Letter to the Editor
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by

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~~It was reported previously that~~ superconductivity was discovered in a number of alloys of bismuth with non-superconducting metals. Another superconducting bismuth alloy has ~~new~~ been found; namely, ~~this is~~ a bismuth-sodium alloy of composition BiNa.

~~As~~ The raw materials for preparation of this alloy ~~we used~~ "Jarel Asch" Bi and "Merck" Na. The alloy was prepared just as before ~~In addition an~~ alloy was made up from "Griffin Tatlock" Bi and "Merck" Na which gave the same results.

by fusion in a sealed-off quartz ampule ~~followed by~~ and then annealing. ~~For~~ the final samples ~~the~~ were annealed ~~was carried on~~ for two days at 400°C. ~~Determination of~~ superconductivity was determined ~~done~~ by measuring ~~both the~~ resistance and ~~the~~ magnetic moment. ~~Measurement of~~ The specimen's resistance was ~~made on~~ in a fragment of the alloy ~~which was~~ cut off from the large cylindrical bar 8 x 20 mm. in size which was used to measure ~~the~~ magnetic moment. The alloy sample used to measure magnetic moment was given the form of an ellipsoid, after which it was very carefully etched to remove any possible surface ferromagnetic impurities. Since the alloy reacts actively with water, ~~the etching of~~ the sample was etched ~~done~~ in pure water. After a sufficient quantity of the sample had dissolved, the sample was repeatedly rinsed in alcohol and then dried, and immediately put into the apparatus, which had been ~~was~~ evacuated and filled with gaseous helium to prevent interaction with atmospheric moisture.

Unfortunately the sample had a considerable number of cracks which caused hysteresis during measurement of the magnetic moment. The resistance curve and the curve showing magnetic moment versus external field were drawn, also the curve of critical field versus temperature. The critical field values for this graph are taken from the magnetic-moment measurements, according to this curve the transition temperature being 2.25°K. The somewhat lower as obtained for the transition temperature from the resistance curve is probably explained by the greater inhomogeneity of the sample used for resistance determining. The value for dH_c/dT is approximately 100 gauss/degree. It should be noted, however, that the value dH_c/dT obtained from the resistance measurements is considerably higher and comes to 250 gauss/degree. It is probable that this difference is due to insufficient homogeneity of the alloy.

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References

(1) N.E. Alekseevski, J.E.T.P. USSR, 18, 101, 1948.

NOTE!
these graphs can be omitted since the context makes no specific references to them!

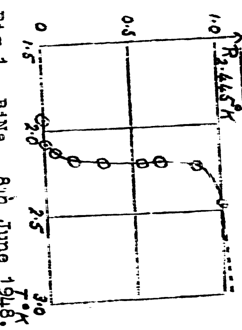

Fig. 1. BiNa. 8th June 1948.

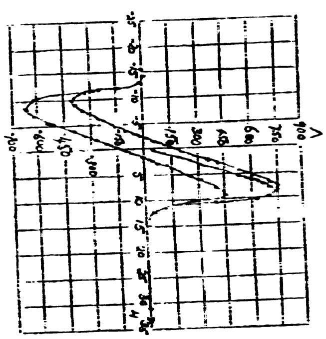

Fig. 2. BiNa. 24th Sept. 1948. p = 10.5 mm. T = 1.775°K.

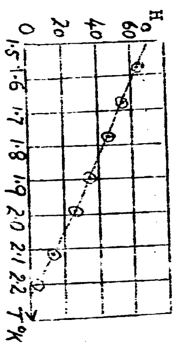

Fig. 3.

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