Proceedings of the Iowa Academy of Science

Volume 41 | Annual Issue Article 84

1934

Electrical Resistivities of Zinc Single and Mosaic Crystals

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A MECHANICAL METHOD FOR THE ANALYSIS OF COMPLEX SPECTRA

J. V. ATANASOFF AND A. E. BRANDT

This paper discusses the application of the punched card equipment, now commonly used in statistical and actuarial work, to the analysis of complex spectra into terms. The spectral frequencies are punched on one set of cards and as complements on another. These cards are then passed in pairs through the tabulator which is provided with a summary punch. The cards from the summary punch are sorted and tabulated. The common differences as well as a code number indicating the lines giving rise to these common differences may be easily read from the tabulation sheet. With the aid of certain refinements, the method becomes very rapid and requires only routine attention on the part of the operator.

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EFFECT OF ADDITIONS OF CADMIUM ON GROWTH OF ZINC CRYSTALS

E. P. T. TYNDALL

Using the Czochralski-Gomperz method and various specimens of zinc containing certainly less than 1 per cent Cd., Schilling[1] encountered mosaic crystals and failed to find the region of successful growth of Hoyem and Tyndall.[2] It has been found, however, that by using zinc containing several tenths of one per cent of Cadmium the mosaics are largely prevented and a region of growth similar to the previous one reappears.

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ELECTRICAL RESISTIVITIES OF ZINC SINGLE AND MOSAIC CRYSTALS

W. J. POPPY

Continuation of the work on electrical resistivity of single crystal zinc completely confirms the value of the ratio of principal

1 Physics 5: 1, 1934.
2 Phys. Rev. 33: 81, 1929.

resistivities previously found in this Laboratory. A slight difference in purity of two lots of zinc which is, however, sufficient to cause a difference in resistivity of about one per cent, does not change this ratio. Further work is being done on the effect of strain on the resistivities of mosaic crystals.

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THERMAL CONDUCTIVITY AND WIEDEMANN-FRANZ RATIO FOR ZINC CRYSTALS

C. A. CINNAMON

The measured thermal conductivities of large bars (30 cm. × 1.2 cm^2) of single crystal zinc obey the Voigt-Thomson symmetry relation. The ratio of the conductivities perpendicular and parallel to the axis is 1.057. Since this agrees with the ratio of the similar electrical conductivities the Wiedemann-Franz ratio is the same for all directions in the crystal. This ratio agrees within 10 per cent with the value predicted by the Sommerfeld theory.

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THE DEPENDENCE OF CYBOTACTIC GROUPS ON SPECIFIC VOLUME

ROSS D. SPANGLER

Additional x-ray diffraction data have been taken on ethyl ether in the region of the critical point. (Spangler, Abstract 24, Phys. Rev. 42, p 907, 1932) Series of diffraction curves at pressures of 39.2, 44.1, 49, and 55 kg/cm with temperatures ranging up to 235°C show, as in previous work, that the cybotactic groupings depend more on specific volume than on temperature. At each of the above pressures, the indications of groups disappear at about the critical specific volume regardless of the higher temperatures at higher pressures. The ionization currents were measured with a direct deflection amplifier employing an FP-54 tube instead of the customary electrometer. With this arrangement data could be