Polarization of λ2537 of Mercury

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THERMOELECTRIC EFFECT IN SINGLE CRYSTAL BISMUTH

R. W. BOYDSTON

Wires of single crystals of bismuth have been prepared by the Czrokalski method. The crystals so far investigated have been of orientations between $10°$ and $40°$. The variations of the thermo-electric properties with orientation is rather slight in bismuth compared with similar effects in zinc as found by Linder, Grüneisen and Goens, and Bridgman.

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POLARIZATION OF RESONANCE RADIATION AND BREADTH OF SPECTRAL LINES

A. ELLETT

Observations of the polarization of the D line resonance radiation of sodium indicate that the transition probabilities for the various components of the Zeeman pattern are substantially in agreement with the predictions of the so-called sum rule. Observations in relatively strong fields show the effect of non-uniform distribution of intensity in the exciting spectral line. The assumption that the distribution of energy in the exciting line is due practically entirely to Doppler effect leads to equations for the variation of polarization with field strength which are well verified experimentally. Any broadening of the line by collision or by a coupling effect is evidently quite small in comparison with the Doppler breadth.

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POLARIZATION OF $\lambda\,2537$ OF MERCURY

HARRY F. OLSON

$1\,S - 2\,p_2$ of mercury excited by plane polarized light shows 79% polarization both in the absence of any magnetic field and in the presence of a field parallel to the electric vector. That the polarization is not complete might be interpreted as due to collisions but more probably is due to the fact that in weak fields some of the fine components of $\lambda\,2537$ have not the same Zeeman

pattern as in strong fields. The polarization with other relative orientations of field and light vector and the variation of polarization with field intensity in weak fields may be interpreted successfully by means of a semi-classical model, with proper relative intensities parallel and perpendicular to the light vector, rotating after excitation with angular velocity $1/2\,g\,(e/m)\,(H/c)$ and emitting a damped wave. From curves connecting polarization, rotation of maximum of polarization, etc., with field intensity $\varkappa$ has been found to be $1.02(\pm 02)\ 10^7\mathrm{sec}^{-1}$.

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MAGNETIZATION OF THIN FILMS OF ELECTRO-LYTIC IRON

E. P. T. TYNDALL

The films of iron are preformed by electrolysis of a three per cent solution of ferrous ammonium sulfate and deposited on a brass cathode. The magnetic properties are similar to those of evaporated films (Sorenson, Edwards), a large increase in coercive force occurring at a thickness of about 50 millimicrons. This effect for electrolytic iron has heretofore been attributed to the occlusion of hydrogen, but the present work makes this hypothesis appear exceedingly unlikely.

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