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## The M-Series Absorption Spectrum of Metallic Bismuth

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Investigation indicates that the desensitizing effect of the cathode ray exposure can be simulated by application of heat, although the temperature to which the emulsion must be raised is surprisingly high. Experiments with other materials indicate that local temperatures in the rayed object may be very high. The importance of this finding has not been appreciated by those working in biological fields.

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### THE M-SERIES ABSORPTION SPECTRUM OF METALLIC BISMUTH

W. D. PHELPS

Using a Siegbahn vacuum spectrometer and thin films of bismuth produced by sputtering, the wavelengths of the five x-ray M-absorption edges of bismuth 83 have been measured. For the edges  $M_1$  and  $M_2$ , which had not previously been measured, the discrepancy between the computed and observed values is of the order of magnitude of experimental error while the usual large  $M_4$  and  $M_5$  discrepancies, first observed in this laboratory on other elements, are verified for bismuth. An interpretation of the large discrepancies between the experimental and computed wavelengths of the edges  $M_4$  and  $M_5$  based on experiments in other fields on the one hand and Block's and Kronig's wave-mechanical theory of energy levels in a crystal on the other is suggested. It is concluded that the  $M_1$ ,  $M_2$ , and  $M_3$  electron in an absorption act go to the top of the filled free-electron levels while the  $M_4$  and  $M_5$  electrons go on out to higher energy levels of the crystal lattice.

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### A STUDY OF THE CYBOTACTIC GROUP STRUCTURE IN ISOPENTANE NEAR THE CRITICAL POINT

CARL A. BENZ

X-ray diffraction curves of scattered intensity as a function of angle have been measured using a Coolidge Molybdenum x-ray tube, and an ionization chamber spectrometer.