

vated adsorption is accompanied by a dissociation into fragments, *e. g.*, CH₃ and H from which, by recombination with adsorbed deuterium and subsequent repetition of the several processes, equilibrium concentrations of the deuterio-methanes finally result. We are prosecuting this study in a quantitative direction and also catalytically, since we have, in this exchange reaction, an important tool for catalytic research in the important field of saturated hydrocarbon reactions. We are again indebted to Dr. R. B. Barnes of the Palmer Physics Laboratory for the use of his infra-red spectrometer.

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THE BETA-PARTICLE FROM ACTINIUM

Sir:

Through the use of a screen-wall tube counter [Libby, *Phys. Rev.*, **46**, 196 (1934)] the upper limit of the energy spectrum of the previously undetected actinium electron has been determined. The actinium was shown to be free from members of the radium and thorium series by precipitating lead sulfide from the sample and measuring the decay curve of the gamma activity. This curve was exponential with a half-life of thirty-seven minutes, in excellent agreement with the known half-life of actinium B. A sample sufficient to give a count of approximately 100 electrons per minute was mounted in a very thin layer. The

magnetic field strength necessary to bend out the most energetic electrons corresponds to an $H\rho$ of about 1750 gauss-cm., or an energy of about 220,000 electron-volts. The fact that 60% of the particles are absorbed by an aluminum screen with a thickness of 0.0023 g./cm.² is in agreement with this value. This energy limit would place actinium on the lower Sargent curve [Sargent, *Proc. Roy. Soc. (London)*, **A139**, 659 (1933)].

The actinium sample was prepared by extraction from Colorado uranium residues and is chiefly cerium and other rare earth chlorides. The sample was treated as follows. Small amounts of salts of barium, lead, and thorium were added, as bodies for the precipitation of the decay products of actinium. The precipitation of barium chromate removed actinium X, the actinium B and C was carried down with lead sulfide, and finally the radioactinium was coprecipitated with thorium peroxyhydroxide. The thorium was previously purified to remove mesothorium I and II, to prevent contamination of the sample with the latter, which is isotopic with actinium. The other decay products are so short-lived that their effect disappears before the activity can be observed.

It is planned to measure the energy spectrum of the disintegration electrons by means of an apparatus to deflect beams of definite energy into a counter.

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RECEIVED FEBRUARY 4, 1935

NEW BOOKS

A Textbook of Inorganic Chemistry. By FRITZ EPHRAIM. Second edition, revised and enlarged, translated from the fourth German edition by P. C. L. Thorne. Gurney and Jackson, 33 Paternoster Row, London, E. C. 4, England, 1934. 873 pp. Price, 28s./- net.

This second English edition, based on the fourth German edition, is larger than the first edition by nearly one hundred pages. This is due, not to any major change, since the titles and arrangement of the thirty individual chapters remain unaltered, but rather to the insertion throughout of many items representing the progress in inorganic chemistry achieved in the interim. The new edition, therefore, retains the characteristics and outstanding virtues of the earlier edition and of the German original, namely, a simplified and eminently readable pres-

entation of a great amount of information in a relatively brief compass.

ARTHUR B. LAMB

Anwendungen der Röntgen- und Elektronenstrahlen, mit besonderer Berücksichtigung organisch-chemischer Probleme. (Application of Röntgen and Electron Rays, with Particular Consideration of Organo-chemical Problems.) By Professor Dr. J. EGGERT, Berlin, and Professor Dr. E. SCHIEBOLD, Leipzig. Akademische Verlagsgesellschaft m. b. H., Markgrafenstrasse 6, Leipzig C 1, Germany, 1934. vii + 190 pp. 101 figs. 16 × 23.5 cm. Price, RM. 18.00; bound, RM. 19.50.

Some lectures delivered at the meeting of the "Deutsche Bunsengesellschaft" in Bonn on May 19, 1934, are here