

into positive and negative ions from a point discharge on to a metal plate, the author shows by two methods the identity of the ions to those studied by Ruth-
erford and Zeleny.

H. T. B.

Dielectricity and Optics

The spectra of hydrogen and the spectrum of aqueous vapor. *J. Trowbridge. Phil. Mag.* [5] 50, 338 (1900). — The following conclusions are drawn :

“ When a condenser discharge is sent through a rarefied gas which is confined in a glass vessel, the gas can no longer be considered in the dry state ; for aqueous vapor is liberated from the glass. When a sufficiently powerful condenser-discharge is employed, dry hydrogen, dry nitrogen, and rarefied air give substantially the same characteristic spectrum. When a very powerful steady battery-current is used to excite the tubes filled with these gases, various compounds of nitrogen and oxygen, nitrogen and hydrogen, are formed if aluminum electrodes are employed.

“ The four-line spectrum of hydrogen in the solar atmosphere is an evidence of aqueous vapor, and therefore of oxygen, in the sun.

“ Conclusions in regard to the temperature of the stars, exhibiting hydrogen spectra, are misleading if based upon conditions of temperature and pressure in glass vessels ; for conditions of electrical dissociation, of aqueous vapor, for instance, in the presence of an excess or lack of supply of oxygen, are the controlling ones rather than conditions of the mere pressure of the gas.

“ X-ray phenomena, produced by a steady battery-current, strongly suggest an electrical theory of the origin of the sun's corona.”

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Radio-active barium and polonium. *F. Giesel. Ber. chem. Ges. Berlin*, 33, 1665 (1900). — To obtain a strongly radio-active substance from uranium nitrate, the concentrated solution of this salt acidified with sulphuric acid is treated with enough barium chloride to avoid precipitation of the sulphate in the concentrated solution. On dilution with water the barium salt is precipitated, strongly contaminated with a radio-active substance. According to Debierne, the active substance in the precipitate is actinium, and not radium. C. G. L. W.

A radio-active substance emitted from thorium compounds. *E. Rutherford. Phil. Mag.* [5] 49, 1 (1900). — In the present paper the author shows that, in addition to the ordinary type of radiation emitted by thorium compounds, there are radio-active particles given off which maintain their radio-active properties for several minutes. The term “ emanation ” is given to these particles. They have the power of ionizing gases and of passing through thin layers of metal and with ease through a considerable thickness of paper. A thin or thick layer of thorium oxide, which is used to study the “ emanation ”, exhibits markedly different properties. The thin layer produces little of the “ emanation ” as compared to the ordinary form of radiation, while the thick layer shows the reverse. The velocity of these particles is exceedingly slow, the slightest current of air in the room being sufficient to blow them about. The author briefly considers the origin and nature of this emanation, which he treats more in detail in the next paper.

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