Conclusions.

That the assumption that all light-sensitive selenium is made up of three components, A, B and C, is probably sufficient to explain all the observed phenomena concerning the change of conductivity of selenium.

That the formula given will probably prove satisfactory except when the amount of C becomes considerably larger than the amount of B.

The indication is that the rate of change of A into B is some larger than the rate of change of B into C, but not as much as twenty times larger. The writer believes, in view of previous results[1] and recent observations, that changes of A into B and of B into C are produced by mechanical pressure, electrical potential, temperature and other agencies, and that through selenium we will be able to deduce quite directly fundamental relations existing between the units of these quantities.

In view of his own observations and those of Ries[2] and others the writer suggests that even moisture by some mechanical means may change B into C.

The recovery of selenium from light effects is being investigated from a similar viewpoint to the one here proposed for the light effect.

The Question of Valency in Gaseous Ionization.[3]

By R. A. Millikan and Harvey Fletcher.

BY directly catching upon oil drops, at the instant of formation, the ions produced in air by γ rays of radium, X rays of varying hardness and β rays of radium and measuring the charges carried by these captured ions it has been shown that the process of ionization by any of these agencies consists in the detachment from a neutral molecule of one single, elementary, electrical charge. If doubly or trebly charged ions are ever formed by the detachment from a molecule of two or three elementary charges, the number of such bi- or trivalent ions cannot, under any conditions thus far experimented upon, be more than one or two per cent. of the number of univalent ions formed.

It is probable therefore, despite the contrary evidence brought forward by Townsend and Franck and Westphall, that the process of ionization in gases never gives rise to ions of either positive or negative sign, which carry more than a single elementary electrical charge.

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[1] Paper by Brown and Stebbins, Phys. Rev., 26, p. 273, 1908.

[2] Paper by Ries, Phys. Zeits., 9, p. 569.

[3] Abstract of a paper presented at the Minneapolis meeting of the Physical Society, December 27–30, 1910.