

of the electrodes. As the value of the negative potential increases, the P.D. across the electrodes remaining the same, the period of flashing diminishes. The following table will show this relationship. The maximum value of the period falls consistently with the increase in divergence of potential of the cathode from the earth.

Negative Potential of Rod (Volts).	Maximum Period of Flashing (Seconds).
237	9.04
247	4.78
296	2.03
435	0.70
483	0.61
533	0.57

It appears that the actual value of the potential of the cathode and the earthing of the outside of the bulb are important factors in the production of these low frequency low voltage discharges in neon lamps.

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Critical Potential in the Coagulation of Colloids by Electrolytes.

THE accepted view of the coagulation of so-called hydrophobe colloids by electrolytes is that it is the result of a diminution of the potential of the electrical

doubt on the above explanation of coagulation by electrolytes. Kruyt and Willigen (*Zeits. Phys. Chem.*, 130, 170; 1927) have recently observed that in the coagulation of arsenious sulphide sol by potassium ferrocyanide, the cataphoretic speed is greater than that of the pure colloid up to the concentrations studied by them; their measurements, however, do not go up to the coagulating concentration. They attempt to get over the difficulty by assuming that the dielectric constant of the medium increases with the concentration of the electrolyte, so that though the cataphoretic speed is higher, the potential of the double layer is smaller than that of the pure sol. A number of observations show, however, that an impossibly large value of the dielectric constant must be assumed in order to reconcile the data with the above explanation. It also appears that the nature and even the manner of preparation of the colloid have a great influence on the cataphoretic speed at the coagulating concentration of the electrolyte. We reproduce our data in the accompanying curves (Fig. 1).

Curves 1, 2, and 3 have been obtained from different dilutions of the same sol, and curves 4, 8, 7, and 9 from Freundlich's and Kruyt's observations. It will be seen that there are, broadly speaking, two types of curves, one (4, 5, and 8) showing a regular diminution with increasing concentration of the electrolyte, while the other curves (1, 2, 3, 6) show a much more complicated behaviour. Both types of curves refer to arsenious sulphide sol, but the method of preparation is different in the two cases. These observations definitely contradict the assumption that coagulation takes place at a critical potential, and consequently call for a theoretical treatment on an altogether different basis.

Attention may also be directed to a feature of curves 2 and 3, which show a drop in the cataphoretic speed during the progress of coagulation. This observation is interesting in connexion with the non-applicability of Smoluchowski's theory to 'slow' coagulation, which Majumdar attempted to explain on the assumption that the aggregation is reversible in slow coagulation but irreversible in 'quick' (*raschen*) coagulation. It may be remarked that Smoluchowski assumes irreversibility of aggregation. It seems the sharp drop in cataphoretic speed points to some irreversible change during aggregation.

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The Average Life Period of an Atom.

IN the first Henry Herbert Wills Memorial Lecture, published in NATURE of Nov. 3, Sir James Jeans has tentatively put forward the view that possibly no atom is eternal, but that they all spontaneously undergo transformations similar to that observed in the radioactive series. In fact, he goes rather further than this, for he suggests that even a hydrogen atom is finally itself converted entirely into radiation by the complete combination of the proton and electron composing it. It is to be observed that he assumes that this process

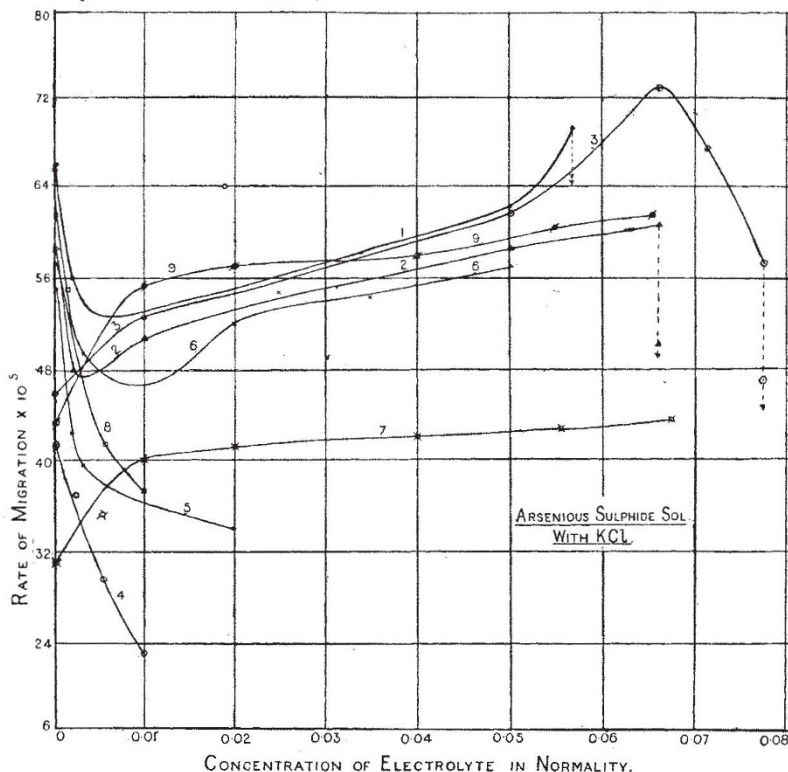


FIG. 1.

double layer. The potential is measured from the cataphoretic speed, u , by means of Helmholtz's equation, $u = D \cdot V / 4\pi\eta$, where D is the dielectric constant, V the potential of the double layer, and η the viscosity coefficient. In 1926, S. G. Choudhury made observations in this laboratory which threw