

XLIII. EFFECT OF THE CONCENTRATION GRADIENT ON THE ELECTRIC FIELD IN A CONDUCTING ELECTROLYTE.

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(abstract)**

Measurements by an electrical method of the electric field in various parts of differently concentrated aqueous solutions of hydrochloric acid show that the field in the liquid proper has maximum value near the cathode. The method of measurement and the apparatus used are described in the preceding paper of these proceedings. Since the cathode is the region approached by the ion of greater mobility the result is in this respect at variance with those which have been obtained with conducting gases.

In gases the effects of ionic diffusion on the field are negligible. In conducting hydrochloric acid, on the other hand, there exist concentration gradients which, by the theory of two-fluid concentration cells, would produce a maximum field strength near the cathode. Since this was the condition observed experimentally, it follows that effects due to concentration polarization are of considerable importance in investigations of the electric field in electrolytes.