The silver nitrate and potassium chloride solutions were made by dissolving known weights of each in distilled water, and afterwards making the solutions up to the desired concentration.

*Experiment II.*—To Determine the Cell Constant.

The constant K which, for a given cell, depends on the size and shape of the electrodes, and on their distance apart, is equal to the ratio $\frac{\text{specific conductivity}}{\text{measured conductivity}}$ or since the conductivity $= \frac{1}{\text{resistance}}$ we have K = specific conductivity X measured resistance. In order to find the value of K a $\frac{N}{50}$ solution of KCl whose specific conductivity at 25°C is known to be $2.768 \times 10^{-3}$, was taken and its resistance found at that temperature by the method described above. The mean of several readings obtained in this way gave a resistance of 29.265 ohms, so that $K = 2.768 \times 10^{-3} \times 29.265 = .08100552$, with this constant the specific conductivity of any other solution was therefore given directly by $\frac{K}{\text{resistance of the solution}}$

*Experiment III.*—To 75 c.c. of redistilled water there was added drop by drop $\left(\frac{1}{30}\text{ c.c.}\right)$ a $\frac{N}{10000}$ solution of HCl and the specific conductivities found for the different concentrations are given in the following tables I, II and III :

TABLE I.

| Temp. | Concentration. | Spec. Conductivity. |
|---|---|---|
| 25°C | Water | $2.70 \times 10^{-6}$ |
| " | $4.4 \times 10^{-8}$n HCl | $2.70 \times 10^{-6}$ |
| " | $8.8 \times 10^{-8}$ " | $2.70 \times 10^{-6}$ |
| " | $22.2 \times 10^{-8}$ " | $2.793 \times 10^{-6}$ |
| " | $66.6 \times 10^{-8}$ " | $2.857 \times 10^{-6}$ |
| " | $133.3 \times 10^{-8}$ " | $3.240 \times 10^{-6}$ |
| " | $222.2 \times 10^{-8}$ " | $3.522 \times 10^{-6}$ |