STUDY OF THE CONDUCTOMETRIC TITRATION SINGLE-LIGAND BARIUM COMPLEXES

A.Bektursinova
M.Berdimuratova
Z.Djumanazarova
Karakalpak State University

Conductometry is the oldest, simplest and least selective of all electrochemical methods of analysis. The conductometric method of analysis is based on measuring the electrical conductivity of a solution. The concentration of a substance in this method is determined by the results of measuring the electrical conductivity. The essence of the method lies in the fact that the specific electrical conductivity χ of the solution is measured during titration and a titration curve is built, which is linear (Fig. 1). The abscissa shows the volume (V) of the solution used during the titration.The titrant volume at the equivalence point is determined from the break of the curve and the results of the analysis are calculated according to the law of equivalents. Conductometric titration uses reactions in aqueous and non-aqueous solutions. During the course of the titration, the electrical conductivity will change markedly if ions with high mobility are introduced or removed.

For the conductometric titration of urea with barium, we prepare 0.001 M barium nitrate.

(That is, to prepare a 0.001 M solution of 50 ml, 13.05 mg of barium nitrate is needed.) To preparea 0.001 M solution of 50 ml, 3 mg of moshevine is required.

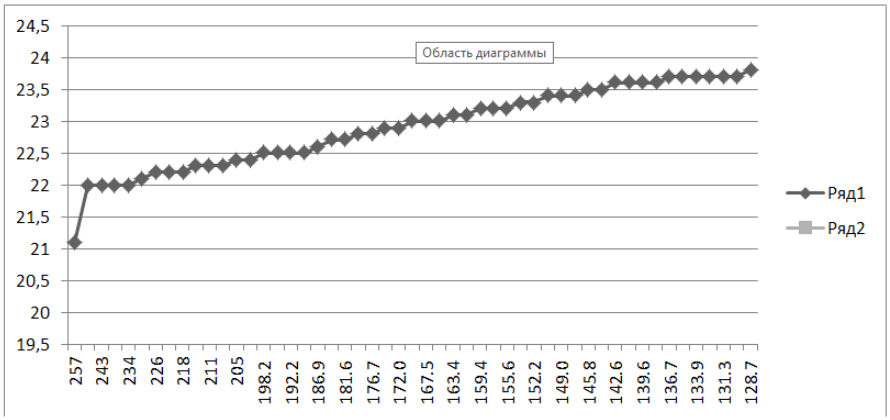

Fig 1. Graph of conductometric titration of a solution of a substance (Ba*K)

This graph shows the conductometric titration of barium nitrate with urea. Conductometric titrations are most commonly used. In conductometric titration, the analyzed solution is placed in a cell with electrodes, the cell is placed on a magnetic stirrer and titrated with the appropriate titrant. The titrant is added in equal portions. After adding each portion of the titrant, the electrical conductivity of the solution is measured and a graph is plotted between the electrical conductivity and the volume of the titrant. As you can see, in the first table, the electrical conductivity was determined in a prepared solution of 50 ml of barium nitrate. Then, by adding 1 ml of urea ligand to it, the electrical

conductivity is determined in a conductometer. In this case, the electrical conductivity is measured and recorded when the ligand is added to every 1 ml of the solution.

The principle of conductometric titration is based on the fact that during the titration, one of the ions is replaced by the other and invariably these two ions differ in the ionic conductivity with the result that conductivity of the solution varies during the course of titration.

When a ligand is added to a salt, their electrical conductivity also affects the temperature. As can be seen from the table, electrical conductivity is inversely proportional to temperature.

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