Proceedings of the Iowa Academy of Science

Volume 34 | Annual Issue Article 46

1927

The Influence of Solvent upon the Optical Rotation of Di-Ethyl Tartrate

T. J. Herbert
State University of Iowa

J. N. Pearce
State University of Iowa

Nebraskan gumbotil, the maximum turbidity for each clay is found at almost identically the same pH, viz., 10.5.

STATE UNIVERSITY,
IOWA CITY.

A STUDY OF THE POTENTIALS AND OF THE ACTIVITIES OF THE METALS IN ZINC AMALGAM CELLS

J. N. PEARCE AND J. F. EVERSOLE

The electromotive forces of cells containing zinc amalgam electrodes in a saturated solution of zinc sulphate, have been determined at 18°, 25° and 30°. The concentration of the zinc in the amalgams varied from $N = 0.000302$ to that of a two-phase amalgam, $N = 0.0638$.

On the assumption that the amalgams form perfect solutions, the theoretical potentials have been calculated for a large number of cells in which each electrode is connected with the most dilute amalgam. The deviations between the observed and calculated values agree fairly well with the values obtained by Richards and Forbes.

Using the Hildebrand equation, and assuming that $K = 11.2$ for the equilibrium, $2\ Zn \rightleftarrows Zn_2$, we have calculated the potentials of the various cells and have found a close agreement between the observed and calculated values; especially is this true as the amalgams approach infinite dilution.

The temperature coefficients of the cells have been determined and from these we have calculated the increase in free energy, in heat content, and in entropy accompanying the cell reaction.

Finally, the activities of the zinc and the mercury in the various amalgams have been calculated.

STATE UNIVERSITY,
IOWA CITY.

THE INFLUENCE OF SOLVENT UPON THE OPTICAL ROTATION OF DI-ETHYL TARTRATE

T. J. HEBERT AND J. N. PEARCE

A determination of the specific rotation of di-ethyl tartrate in various mixed-solvents has been made at 25° and 30°, using two different concentrations of the ester. The solvents used were ethyl alcohol, methyl alcohol, benzene and toluene and the binary mixt-

ures of each solvent with each of the remaining solvents. The mixed solvents were made on a mol fraction basis.

The specific rotation was found to be dependent on the composition of the mixed-solvent, upon the concentration of the ester and upon the temperature. It was also found to be influenced by the nature and proportions of the two solvents forming the binary mixture.

STATE UNIVERSITY,
IOWA CITY.

THE NEWLY COMPLETED WATERWORKS OF THE CITY OF ONEIDA, NEW YORK

NICHOLAS KNIGHT

The supply comes from Florence Creek, 22 miles north of the city. A 20-inch main conveys the water. The watershed contains 17 squuare miles, very sparesly settled and the danger from contamination is slight. There is an unusual amount of precipitation in that section of New York State, and in the dryest year of recent times, the rainfall was 41.28 inches.

A dam 400 feet long and 50 feet high, near the village of Taberg will impound the water, 200,000,000 gallons. It is estimated that this would furnish the city a three months' supply, should no rain fall during the period.

The paper contains a complete chemical analysis of the former supply which was unusually hard in $CaSO_4$; and also an analysis of the new supply which is unusually soft and pure. Both analyses were made in the Cornell College laboratories.

Oneida is a manufacturing city and it is already experiencing quite a boom on account of the quantity and excellent quality of its water supply.

CORNELL COLLEGE,
MT. VERNON, IOWA.

NEW HALOGENATED DERIVATIVES OF VANILLIN

L. CHAS. RAIFORD AND W. C. STOESSER

Carles [Bull. Soc., Chim., 17, 14 (1872)] prepared a monoiodovanillin in 1872, but did not prove its structure. Tiemann and Haarmann [Ber., 7, 615 (1874)] obtained a monobromo derivative that was shown by Dakin [Am. Chem. J., 42, 473 (1909)]