Proceedings of the Iowa Academy of Science

Volume 47 | Annual Issue Article 36

1940

# Vapor Density, Liquid Density and Surface Tension of Solutions of Potassium Thiocyanate in Liquid Sulfur Dioxide for 10° to 25° C

W. G. Eversole
*State University of Iowa*

G. H. Wagner
*State University of Iowa*

# THE EFFECT OF GELATIN ON THE SOLUBILITY OF HYDROGEN AT 25°C.

W. G. EVERSOLE AND ALLEN L. HANSON

The solubility of hydrogen in water and in dilute gelatin solutions has been measured by noting the change in volume of the hydrogen when placed in contact with the gas-free solvent. The latter was freed of all dissolved gases by prolonged boiling under reduced pressure. This solvent (water or gelatin sol), was then sealed hermetically in a glass bulb and transferred to the main apparatus. Hydrogen was prepared electrolytically and purified by passing over platinized asbestos at about 250°C. It was saturated with water vapor and introduced over mercury into a gas burette. By displacement with weighed portions of mercury, known volumes of solvent were placed in contact with the hydrogen. The mercury level in the burette was read before and after solution, and the volume of gas dissolved was computed. By means of a barostat constant pressure was maintained, and the temperature was held at 25°C. The observed volume change of hydrogen was converted to mols per hundred grams of water. The solubility in very dilute (one per cent or less) gelatin sol was compared with that in water. The extent of hydration of gelatin was calculated on the assumption that the water thus bound was not available as solvent for the hydrogen.

DEPARTMENT OF CHEMISTRY,
STATE UNIVERSITY OF IOWA,
IOWA CITY, IOWA.

---

# VAPOR DENSITY, LIQUID DENSITY AND SURFACE TENSION OF SOLUTIONS OF POTASSIUM THIOCYANATE IN LIQUID SULFUR DIOXIDE FROM 10° TO 25°C.

W. G. EVERSOLE AND G. H. WAGNER

The vapor density, liquid density and differential capillary rise of pure liquid sulfur dioxide, and sulfur dioxide solutions of potassium thiocyanate were measured at 10, 15, 20, and 25°C. in a sealed apparatus which allowed the measurement of all these quantities on the same solution.

The apparatus consisted of two Pyrex capillaries sealed on to a

Pyrex tube of 16.3 mm diameter in which a quartz bob was suspended from a calibrated quartz spring. By weighing the bob in the vapor, inverting, and weighing in the liquid, the densities could be determined to $\pm$ 0.02 mg/ml. All distances including the capillary heights were measured by a special microscope which could be read to $\pm$ 0.00006 cm. Differential capillary rises could be duplicated to better than $\pm$ 0.0002 cm.

From the surface tension and its rate of change with temperature the Fötvös constant, critical temperature, total surface energy and Paracor for sulfur dioxide were calculated. For the concentrations of potassium thiocyanate studied, a rise in the surface tension and liquid density was found at each temperature.

DEPARTMENT OF CHEMISTRY,
STATE UNIVERSITY OF IOWA,
IOWA CITY, IOWA.