

ABSTRACT

MEASUREMENTS OF EFFECTIVE HENRY'S LAW CONSTANTS FOR HYDROGEN PEROXIDE IN CONCENTRATED SALT SOLUTIONS

The solubility of hydrogen peroxide was measured in concentrated salt solutions of ammonium sulfate, ammonium nitrate, ammonium chloride, and sodium nitrate at 19 °C. Effective Henry's Law constants are reported for these salts for concentrations from 1M to 10 M. Measurements at 13 °C were obtained for several solutions to validate the experimental approach used and the temperature dependency of the Henry's Law constants. Hydrogen peroxide concentrations ranging from 2.0×10^{-3} M to 1.0×10^{-2} M were used in this study. Henry's Law constants determined in this work for hydrogen peroxide in pure water are $(1.26 \pm 0.06) \times 10^5$ M atm⁻¹ and $(2.1 \pm 0.2) \times 10^5$ M atm⁻¹ at 19 °C and 13 °C respectively. Salts containing ammonium ions were found to increase the solubility of hydrogen peroxide by up to a factor of two compared to pure water, but in sodium nitrate solutions the solubility decreased with increasing salt concentration.

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