

# Proceedings of the Iowa Academy of Science

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Volume 38 | Annual Issue

Article 20

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1931

## The Solubility of Certain Substituted Benzoic Acids in Typical Salt Solutions at 25°

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### Recommended Citation

Pearce, J. N. and Newsome, J. W. (1931) "The Solubility of Certain Substituted Benzoic Acids in Typical Salt Solutions at 25°," *Proceedings of the Iowa Academy of Science*, 38(1), 163-164.

Available at: <https://scholarworks.uni.edu/pias/vol38/iss1/20>

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THE INTERFACIAL TENSIONS OF MINERAL OIL  
AGAINST VARIOUS AQUEOUS SOLUTIONS  
AT 40°C

W. G. EVERSOLE AND DALLAS S. DEDRICK

(Abstract)

A new and highly improved apparatus for the direct measurement of interfacial tensions by the drop weight method has been devised. By means of an automatic recording device, measurements may be conveniently made on larger volumes and at slower dropping speeds than were heretofore possible. This is particularly valuable when measuring interfacial tensions between liquids containing surface active solutes.

Preliminary measurements using purified paraffin oil and aqueous solutions of sodium formate, sodium acetate and sodium propionate give very promising results from the standpoint of accuracy and reproducibility. The interfacial tension lowering increases with the length of the carbon chain. In sodium acetate and sodium propionate, the interfacial tension decreases hyperbolically up to saturation but in the case of sodium formate the interfacial tension passes through a minimum at about 2.5 molal.

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THE SOLUBILITY OF CERTAIN SUBSTITUTED BENZOIC ACIDS IN TYPICAL SALT SOLUTIONS AT 25°

J. N. PEARCE AND J. W. NEWSOME

The solubility of the ortho-, meta- and para aminobenzoic acids, of the ortho-, meta- and para hydroxybenzoic acids, and of ortho- and meta nitrobenzoic acids in typical salts solutions at 25° has been determined. The salts were sodium chloride, barium chloride, potassium sulphate and magnesium sulphate.

The activity coefficients,  $s_0/s$ , have been calculated. In general,

the activity coefficients tend to pass through a minimum value and then to increase rapidly with increase in the salt concentration.

While the chlorides of barium and sodium show the same general tendency to increase the activity coefficients of these acids, exactly the reverse is true of the two sulphates. The influence of the sulphates is attributed to the formation of the  $\text{HSO}_4^-$  ion. The greater decrease in the activity coefficients in the presence of potassium sulphate is assumed to be due to the greater hydration of the magnesium ion.

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### THE VAPOR PRESSURES OF AQUEOUS SOLUTIONS OF LITHIUM NITRATE AT 25°

J. N. PEARCE AND A. F. NELSON

The vapor pressures of aqueous solutions of lithium nitrate at 25° have been measured by the dynamic method for concentrations ranging from 0.1 M up to saturation. From the data obtained has been calculated the activity of the solute and solvent. The activity coefficients of the salt were calculated by means of the "h" function of Lewis and Randall. The free energy of dilution has been calculated. The activity coefficients show a minimum at about 0.6 M. The same thermodynamic properties for aqueous solutions of potassium chloride, potassium iodide and sodium bromide have been recalculated and compared.

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### SOME PHYSICAL PROPERTIES OF AQUEOUS SALT SOLUTIONS

J. N. PEARCE AND M. A. HOOPER

The refractive indices of solutions of the alkali halides and nitrates were determined at 25° and from these the specific refractivities of both the solution and solute were calculated by means of the Lorenz-Lorentz formula. From density data the partial molal volumes were also calculated. The dielectric constants of the solutions were calculated by means of the Huckel relation involving the