

Surface Tension and Related Thermodynamic Quantities of Aqueous Electrolyte Solutions (Surfactant Science)

By Norihiro Matubayasi

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Surface tension provides a thermodynamic avenue for analyzing systems in equilibrium and formulating phenomenological explanations for the behavior of constituent molecules in the surface region. While there are extensive experimental observations and established ideas regarding desorption of ions from the surfaces of aqueous salt solutions, a more successful discussion of the theory has recently emerged, which allows the quantitative calculation of the distribution of ions in the surface region. **Surface Tension and Related Thermodynamic Quantities of Aqueous Electrolyte Solutions** provides a detailed and systematic analysis of the properties of ions at the air/water interface.

Unifying older and newer theories and measurements, this book emphasizes the contributions of simple ions to surface tension behavior, and the practical consequences. It begins with a general discussion on Gibbs surface thermodynamics, offering a guide to his theoretical insight and formulation of the boundary between fluids. The text then discusses the thermodynamic formulae that are useful for practical experimental work in the analysis of fluid/fluid interfaces.

Chapters cover surface tension of pure water at air/water and air/oil interfaces, surface tension of solutions and the thermodynamic quantities associated with the adsorption and desorption of solutes, and surface tension of simple salt solutions. They also address adsorption of ions at the air/water interface, surface tension of solutions and the effect of temperature, adsorption from mixed electrolyte solutions, and thermodynamic properties of zwitterionic amino acids in the surface region. Focusing on the thermodynamic properties of ions at air/fluid interfaces, this book gives scientists a quantitative, rigorous, and objectively experimental methodology they can employ in their research.

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Editorial Review

About the Author

Norihiro Matubayasi, Ph.D., is a professor of chemistry in the Faculty of Fisheries, Nagasaki University, Japan. His current research activities are in surface science, with emphasis on thermodynamic properties of surface active molecules at the fluid/fluid interface. His recent research involves the adsorption and desorption of ions of simple salt solutions. He received Ph.D. and M.S. degrees in chemistry from Kyushu University, and a B.S. from Saga University, Japan.

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