Know More

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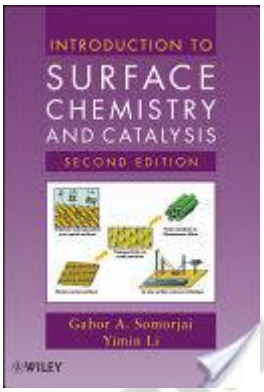
Weblinks

- https://en.wikipedia.org/wiki/Gibbs_isotherm
- http://old.iupac.org/reports/2001/colloid_2001/manual_of_s_and_t/node36.html
- https://en.wikipedia.org/wiki/Surfactant
- http://www.intertek.com/chemicals/surface-active-agent-surfactant/

Suggested Readings



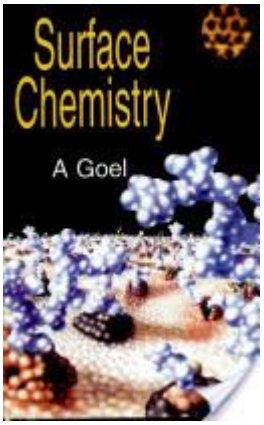
Title Introduction to Surface Chemistry and Catalysis

Authors Gabor A. Somorjai, Yimin Li

Edition 2, illustrated

Publisher John Wiley & Sons, 2010

ISBN 047050823X, 9780470508237



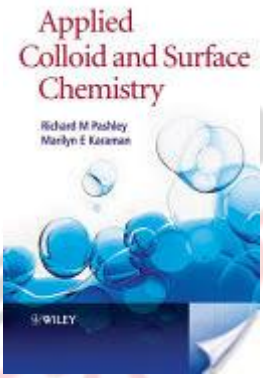
CHEMISTRY	Paper No. 10: Physical Chemistry –III (Classical Thermodynamics, Non-Equilibrium Thermodynamics, Surface Chemistry, Fast Kinetics
	Module No. 25: Gibbs Adsorption equation, surface activity and surface films

Title Surface Chemistry

Author A. Goel

Publisher Discovery Publishing House, 2006

ISBN 8183561500, 9788183561501



Title Applied Colloid and Surface Chemistry
Wiley InterScience online books

Authors Richard Pashley, Marilyn Karaman

Publisher John Wiley & Sons, 2005

ISBN 0470868848, 9780470868843

Glossary

C

Centrifugal force- a force, arising from the body's inertia, which appears to act on a body moving in a circular path and is directed away from the centre around which the body is moving.

CHEMISTRY	Paper No. 10: Physical Chemistry –III (Classical Thermodynamics, Non-Equilibrium Thermodynamics, Surface Chemistry, Fast Kinetics
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Chemical potential- a thermodynamic function expressing the ability of an uncharged atom or molecule in a chemical system to perform physical work.

D

Double layer (**DL**, also called an **electrical double layer**, **EDL**)- is a structure that appears on the surface of an object when it is exposed to a fluid.

E

Electroosmotic flow- is the motion of liquid induced by an applied potential across a porous material, capillary tube, membrane, microchannel, or any other fluid conduit.

G

Gibbs free energy-is a thermodynamic potential that can be used to calculate the maximum or reversible work that may be performed by a thermodynamic system at a constant temperature and pressure.

P

Potential difference- between two points in a circuit is the work done in moving unit charge (i.e. one coulomb) from one point to the other.

S

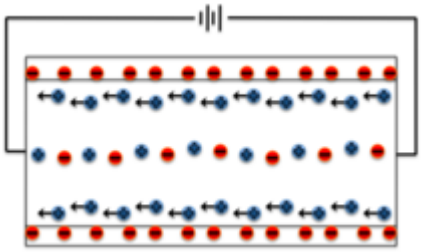
Surface active agent (or surfactant)- is a substance which lowers the surface tension of the medium in which it is dissolved, and/or the interfacial tension with other phases, and, accordingly, is positively adsorbed at the liquid/vapour and/or at other interfaces.

Surface tension- the tension of the surface film of a liquid caused by the attraction of the particles in the surface layer by the bulk of the liquid, which tends to minimize surface area.

Z

Zeta potential- the potential difference existing between the surface of a solid particle immersed in a conducting liquid (e.g. water) and the bulk of the liquid.

Time-Lines

Timelines	Image	Description
1809 A.D.	 Electroosmotic flow schematic	Electroosmotic flow was first reported in 1809 by F. F. Reuss in the Proceedings of the Imperial Society of Naturalists of Moscow. He showed that water could be made to flow through a plug of clay by applying an electric voltage. Clay is composed of closely packed particles of silica and other minerals, and water flows through the narrow spaces between these particles just as it would through a narrow glass tube. Any combination of an electrolyte (a fluid containing dissolved ions) and an insulating solid would generate electro-osmotic flow, though for water/silica the effect is particularly large. Even so, flow speeds are typically only a few millimeters per second.

1921-1926 A.D.	$r = kC_S^2 \frac{K_1 K_2 C_A C_B}{(1 + K_1 C_A + K_2 C_B)^2}$	Langmuir–Hinshelwood mechanism suggested by Irving Langmuir in 1921 and further developed by Cyril Hinshelwood in 1926, two molecules adsorb on neighboring sites and the adsorbed molecules undergo a bimolecular reaction.
1938 A.D.	$r = kC_S C_B \frac{K_1 C_A}{K_1 C_A + 1}$	Eley–Rideal mechanism proposed in 1938 by D. D. Eley and E. K. Rideal, only one of the molecules adsorbs and the other one reacts with it directly from the gas phase, without adsorbing ("nonthermal surface reaction").

Research journal

Description
THE ADSORPTION OF FLEXIBLE MACROMOLECULES. PART II. THE SHAPE OF THE ADSORBED MOLECULE; THE ADSORPTION ISOTHERM SURFACE TENSION, AND PRESSURE[1] **A. Silberberg** *J. Phys. Chem.*, **1962**, *66* (10), pp 1884–1907 **DOI:** 10.1021/j100816a024 Publication Date: October 1962 ***Source:*** http://pubs.acs.org/doi/abs/10.1021/j100816a024

Applications on electrophoresis

- **DNA Analysis**

Electrophoresis is one way of analyzing DNA, deoxyribonucleic acid, which is the code that contains all the traits you inherited from your parents. DNA is arranged in sequences, for instance, one sequence represents the color of your eyes and another sequence represents the color of your skin. Through electrophoresis, specific DNA sequences can be analyzed, isolated and cloned. The analyzed DNA may be used in forensic investigations and paternity tests.

- **Protein Analysis**

Electrophoresis has advanced our understanding on the structure and function of proteins. These molecules are needed by our body cells and may be analyzed, for instance, by getting blood and urine samples. Then through electrophoresis, the amount of proteins in your blood or in your urine is measured and compared to established normal values---lower or higher than the normal levels usually indicates a disease.

- **Antibiotics Analysis**

The application of electrophoresis in antibiotic studies dates back to the 1950s. Further studies led to improved electrophoretic techniques and new antibiotics. These drugs, such as penicillin, are among the widely prescribed drugs against bacterial infections. With electrophoresis, experts are not only able to synthesize new antibiotics but are also able to analyze which types of bacteria are antibiotic-resistant.

- **Vaccine Analysis**

Vaccine analysis is one of the many important applications of electrophoresis. There are several vaccines that have been purified, processed and analyzed through electrophoresis, such as the influenza vaccine, hepatitis vaccine and polio vaccine. The exact steps done in the vaccine analysis, however, cannot be determined due to confidentiality reasons of the pharmaceutical companies. Nevertheless, data reports from vaccine manufacturers such as Wyeth, Merck and Sanofi-Aventis presents electrophoresis as an effective vaccine analysis method.

SOURCE- http://www.ehow.com/about_5606215_list-applications-electrophoresis.html