
Norwegian American chemical engineer, chemist and inventor; to US (1928), US citizen (1945), chemical solutions, statistical mechanics, devised gaseous diffusion method for manufacture of uranium 235, Onsager law of dilute solutions (1931), Onsager reciprocal theorem (1930s), Onsager relations sometimes called the fourth law of thermodynamics, faculty at Brown Univ. (1929-1933), Yale Univ. (1934-1972), NAS (1947), Nobel prize (1968) (BEST BM60 CB58 CDOSB DOT L&M MWBD RS24 WWWIA WWWIS: see References.)

Onsager, Lars from The Hutchinson Unabridged Encyclopedia with Atlas and Weather Guide

Norwegian-born US physical chemist. He worked on the application of the laws of thermodynamics to systems not in equilibrium, and was awarded the Nobel Prize for Chemistry in 1968 for his discovery of reciprocal relations, fundamental for the thermodynamics of irreversible processes. In 1949 he established a firm statistical basis for the theory of liquid crystals.

Career Onsager was born in Christiania (now Oslo) and studied at Norges Tekniske Høgskole in Trondheim. After working in Zürich, Switzerland, as research assistant to Dutch chemist Peter Debye, Onsager emigrated to the USA in 1928. As a lecturer, first at Brown University and from 1933 at Yale, he was a failure: the students named his courses ‘Sadistical Mechanics’ and ‘Advanced Norwegian I and II’.

At Brown University Onsager submitted a PhD thesis on what is now a classic work on reversible processes, but the authorities turned it down. It was published in 1931 but ignored until the late 1940s; in 1968 it earned Onsager the Nobel Prize. At Yale his paper called ‘Solutions to the Mathieu equation of period $4\pi$ and certain related functions’ was passed in incomprehension among the chemistry, physics, and mathematics departments before Onsager got his PhD.

The Onsager limiting law In Zürich Onsager put forward a modification to the Debye–Hückel ionization theory. Now known as the Onsager limiting law, this gave better agreement between calculated and actual conductivities.

The fourth law of thermodynamics Investigating the connection between microscopic reversibility and transport processes, Onsager found that the key to the problem is the distribution of molecules and energy caused by random thermal motion. Ludwig Boltzmann had shown that the nature of thermal equilibrium is statistical and that the statistics of the spontaneous deviation is determined by the entropy. Using this principle Onsager derived a set of equations known as Onsager's law of reciprocal relations, sometimes called the fourth law of thermodynamics.

© RM, 2016. All rights reserved.

https://search.credoreference.com/content/topic/onsager_lars_1903_1976


https://search.credoreference.com/content/topic/onsager_lars_1903_1976