CHRONICLES

New Book “Physical Chemistry of Surface”

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The end of the past and the beginning of the new century were marked by the development and flourishing of sciences on the interactions between phases. Interface phenomena are reflected most clearly in nanosystems, which attract the seemingly infinite interest. Apparently, it is impossible to develop various nanotechnologies without gaining deep insight into the mechanism of interaction between different phases. The latter is sufficient to justify the appearance of this book devoted to the physical chemistry of surfaces. An additional argument for the appearance of this book is that the last Russian edition of a comprehensive textbook on physical chemistry of surfaces was published as long as thirty years ago. The textbook in question was “Physical Chemistry of Surfaces” by A. Adamson, published in 1979. And although the latter book is nonetheless far from losing its significance, time passed since its appearance was characterized by considerable progress in the studies of surface phenomena.

The book presented to readers¹ is written by a famous scientist in the field of physical chemistry of surface phenomena. In preparing this book, the author posed the following two main goals: to introduce readers to the modern concepts on processes that occur on interfaces and to give the most complete picture of surface phenomena. First of all, it should be admitted that the author managed to solve these rather difficult problems. Moreover, the book considers not only different compositions of equilibrium interfaces the description of which was the exclusive subject of many earlier monographs and textbooks but also the wide spectrum of irreversible phenomena. The description of surface phenomena is given on both macroscopic (thermodynamic) and microscopic levels.

The book includes sixteen chapters, ten of which are devoted to equilibrium surfaces and six chapters deal with irreversible processes. In addition to classical surface phenomena, the effects revealed in recent years are considered. The latter include reconstruction of solid

surfaces, surface fusion, phase transitions in the adsorption and nonsoluble monolayers, wetting transitions. The mechanism of the formation of fractal surfaces and their properties are described. The modern concepts on the migration of atoms and small clusters over the surfaces of crystals and the mechanism of surface-enhanced Raman scattering are described. In doing this, the wide diversity of phenomena were theoretically described from unified positions, namely, within the framework of the mean field approximation that allows a sufficiently easy and at the same time rigorous consideration of one or another process to be carried out.

The book cites the major studies devoted to surface phenomena. The number of cited publications approaches six hundred. They include key publications and reviews, as well as original studies, that would allow the readers to better orientate themselves in the vast stream of modern periodic literature.

The spectrum of problems considered in this book is very wide. Such a broad embracement of the material was undoubtedly due to the wide research practice of the author within the walls of the Frumkin Institute of Physical Chemistry and Electrochemistry of the Russian Academy of Sciences, where he occupied and still occupies the leading position in the studies of equilibrium and nonequilibrium processes on interfaces. The author of this book was in constant contact with scientists from many laboratories of this institute, which is reflected in his publications devoted to different aspects of interface phenomena and in the broadness and depth of the presented material.

The presented book “Physical Chemistry of Surface” will allow the students and post-graduates to get acquainted with the basics and the state of the art in the studies of solid and liquid interfaces and familiarize themselves with the wonderful realm of surface phenomena. This book may be interesting for scientists who have already cognized the unusualness and wide diversity of the realm.

¹ V.I. Roldugin, *Fizikokhimiya poverkhnosti* (Physical Chemistry of Surface), Dolgoprudnyi: Izdatel'skii Dom “INTELLEKT”, 2008.

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