

»METHORICS« — THE NAME FOR THE PHYSICS AND CHEMISTRY OF THE INTERBOUNDARY REGION

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There is an immense number of phenomena, such as adsorption, coagulation, crystal growth, precipitation, electrode processes, activity of heterogeneous catalysts, specific biological reactions, and many others, where the surface structures and reactions play the decisive rôle.

All these fields, in spite of their most important bearing on our scientific, technological and medical conceptions and needs, are beyond the power of our scientific tools for immediate observation. There is, therefore, a number of open questions such as the monolayer or multilayer adsorption, the structure of the electrical double layer, the puzzling problems of the crystal growth, the existence of the glass-like Beilby layer, the specific catalytic action, the enzymatic specificity, the antigen-antibody mechanism etc.

It is clear that in the majority of cases only the phases which are meeting in the critical interboundary layer are strictly definable, at least experimentally. But the structure of this borderline region, i. e., the physical and chemical morphology which is reflected in the typical as well as in the specific behaviour of the system, can be investigated only by observation and correlation of a great number of experimental facts determined by methods of great variety, which are carefully and systematically applied in respect to all relevant chemical and physical factors.

All the data concerning the structure and reactions of the solid bodies, especially the so called structure-sensitive phenomena, the processes of adsorption, the occlusion, the normal and abnormal crystal growth, the precipitation and dissolution, the coagulation and peptisation, the membrane effects, the electrodic, catalytic and biological reactions which are characterized by their specificity etc., in brief, all of the phenomena where the main process may proceed in a great variety of ways, responding to the slightest change of the conditions in the composition, the concentration, or the temperature of the surrounding media, are in this respect of special interest. As the equilibrium in one phase, at least, is usually very movable, and the number of processes in a system very closely interrelated, the influence of the »internal environment« on the balance condition in the boundary state cannot be too much emphasized. Apart from this, stress should

be laid also on the fact that for an adequate explanation of the many phenomena of this class, we must know not only a great number of factors prevailing at the moment of observation, but also the previous history of the system, the succession of the events through the reaction time («Diachronie» Kohlschütter's), as well. Thus, the genetics of the system are an important mode of approach, and it seems that by constructing something similar as a synoptic map of the behaviour of the system in a critical time, it would be possible to reveal the actual structure of the interboundary layer.

As a consequence of the variety of theoretical outlooks and of the complexity of the experimental methods applied, it is not surprising that there are many names in use denoting this critical transition layer, and the reactions conditioned by it. We have here the »boundary state« (W. B. Hardy), »topochemical« reactions (V. Kohlschütter¹), »Zwischenzustände (G. F. Hüttig²), »surface phase« (J. T. Davies and E. K. Rideal³), the physics and chemistry of surfaces, interfaces, etc.

If we take as starting point of every investigation of this kind the definition of the ordinary phases beyond the boundary region, it seems advantageous to use as a new international name: the *methoria*, for the intermediate boundary space between our definable phases. Consequently, the physics and chemistry of such — methoric — spaces may be named *methorics*. These names were proposed by Wo. Ostwald⁴), and are derived from *μεθ όριος, ή μεθορία* lat. *confinis, confinis regio*⁵). The meaning of the term *methoria* points out clearly the significance of the two or more boundaries and the region between them. The thickness of the methoric layer in systems mentioned above varies from some ångströms to many millimicrons or in some cases to the dimensions of one or many microns, and may possess a quite specific structure which by means of the operating kinetic and potential energies through the arrangement of its elements (electrons, ions, atoms, radicals or molecules) controls the whole course of the process under observation. The knowledge

¹) V. Kohlschütter, Kolloid-Z. 50, 1 (1930).

²) G. F. Hüttig in G. M. Schwab, Hdbch d. Katalyse VI, 322 (Wien 1943).

³) J. T. Davies and E. K. Rideal, J. Colloid Sci, 3, 313 (1948).

⁴) Wo. Ostwald, Kolloid-Z. 100, 2 (1942) footnote 40.

⁵) H. Stephanus, Thesaurus Graecae Linguae, Parisiis, 1842—1846, p. 677: Thuc. 2, [27]: *Η δὲ Θυρσαῖτις γῆ μεθορία τῆς Ἀργελας καὶ Λακωνικῆς, μ. ποταμῶς, Fluvius quo duae regiones disterminantur; Xen. Cyrop, μεθόριον est etiam Interstitium quo res quaelibet disterminantur.*

of the more or less detailed architecture of the boundary region is of such importance in pure and applied sciences that a focusing of the attention to the elements in common to all structures of this kind is quite natural. It seems, to us therefore, that a common and internationally accepted name for the researches in this field is highly desirable. Hence our plea for the above proposal.

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IZVOD

Metorika kao naziv za znanost o graničnim slojevima

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S obzirom na vrlo veliki broj pojava kao što su adsorpcija, koagulacija, rast kristala, taloženje, elektroдни procesi, aktivitet heterogenih katalizatora, biološke specifične reakcije i druge, gdje površinske strukture i reakcije igraju presudnu ulogu, naglašeno je značenje strukture prelaznog sloja između dviju faza, koje se mogu manje ili više eksperimentalno definirati. Istaknuto je, da je nemoguće direktno odrediti strukturu ovakovog sloja, nego se pri tom mora primijeniti vrlo veliki broj opažanja fizičkog i kemijskog karaktera.

Da se barem u imenu naglasi potreba i nastojanje s obzirom na određivanje strukture tog prelaznog sloja, koji se odražava u morfologiji promatranog sistema, kao i njegovoj genetici, stavlja se predlog, da se kao internacionalno ime uvede naziv »metorika«. Nazivom »metorika« bi se označavala fizika i kemija prelaznih slojeva, koji se nalaze između dviju definiranih faza, i u tom smislu je prikazano izvorno značenje riječi *μεθόριος, ή μεθορία* kao naziv za područje, koje se nalazi između najmanje dva druga poznata područja.

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