



## ECOLOGICAL CHEMISTRY OF THE NATURAL WATERS

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By chemical point of view, the natural waters represent very dilute solutions, which include the following component parts: the dissolved gases; the macro-elements that determine mineralization; different mineral forms of the biogenic elements; the micro-elements; the various types of organic substances and pollutants. All these components are studying within the Hydrochemistry and this study is a well known as classical treating. By physico-chemical point of view, the natural waters represent an open photochemical system, catalytic, with several components and phases. In the natural waters take place redox processes, which is carried out, usually, in the presence of metal ions with the variable valence. The composition of the natural waters is not constant, being determined by several factors: climate conditions, the variety of microflora, duration and intensity of solar radiation, anthropic factor etc. As a result of the redox processes, in the natural waters are formed a large number of active substances: hydrogen peroxide, singlet oxygen, ozone, free radicals, etc. For adequate estimating of the status of the natural waters is necessary to use different methods of research, including the study of physical, chemical and biological processes, that occur in the aquatic ecosystems.

Of the most important oxidative equivalents from the water systems are dissolved oxygen and hydrogen peroxide. The specifics of these oxidants are that they have a quite low reactivity, and to increase it is need their activation by means of some metal ions, for example copper or iron. Therefore, in the 90s of last century the academician Gheorghe Duca launches the theory, according to which complex estimating of the status of aquatic objects can not be achieved only through traditional hydro analysis parameters, but also by applying advanced methods, which describe more completely the chemical processes that occur in the natural waters and characterizes most appropriately the water, as living environment for hydrobionts. The proposed theory is based on the concept of the waters redox state and results from the analysis of the legalities of the redox equivalents balance in the aquatic environment. The proposed concept denotes the necessity of introducing and implementation of new methods for the characterization of natural water status and estimating of their self-purification capacity. Underlying of elaboration of the kinetic methods for complex estimating of the atate of aquatic objects are the basic principles discussed further.

Therefore, application of the kinetic parameters, determination of the waters redox state through the content of hydrogen peroxide, of their inhibition capacity and of the stationary concentrations of the OH radicals, estimate the dynamic balance between oxidative equivalents and reductants in the natural waters and can serve as a integral parameter of the balance of redox-catalytic processes within aquatic basin and of the intensity of self-purification processes with the participation of OH radicals and can characterize ecological state of this environment.