

## Theory of systems with chaos of chemical composition in nature and technology

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### Abstract

According to the theory developed by the author, a substance is built from statistical ensembles more general than atoms, molecules, and supramolecular structures, namely, from multicomponent systems with chaos of chemical composition (MSCC). Any imperfect substance exists in the form of multicomponent systems with chaos of composition and consists of an infinite number of components. It is shown that all natural and man-made substances are MHS, with varying degrees of chemical chaos. According to the theory, MSCC with small composition chaos are distinguished, which are identified as individual substances and systems with significant chaos – multicomponent mixtures. Natural MSCC with significant Gaussian compositional chaos include hydrocarbon systems, for example, natural gases, fuel fractions, gas condensates, space systems, for example, interstellar dust and gas clouds, geochemical, and biogeochemical objects. Technogenic MSCC are obtained by processing natural systems, such as coal tar, and oil refining. Biogenic MSCC include humic acids, blood plasma, etc. Individual substances (colorblind) are Poisson systems with chaos of chemical composition, or systems with small chaos of composition. MSCC are objects that manifest themselves as a whole in physicochemical processes. These systems are qualitatively different from conventional mixtures by a certain statistical law of the distribution of the composition according to physicochemical properties and have thermodynamic and kinetic features. For example, the Ministry of Agriculture does not comply with the law of consistency. To characterize such systems, it is proposed to use the informational entropy of the composition and the entropy of the diversity of components. The point of view on matter as a system with chaos of composition is justified, one of the laws of evolution of which is the increase in the entropy of the diversity of states, which is the source of evolution of the MSCC.

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