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Thematic course: Energy and electromagnetic processes in open systems with the participation of associates and colloidal clusters. Part 1.

The polarization of gels and colloidal optical diffraction in oxyhydrate, as well as streaming cluster spectroscopy

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Abstract

In the present work we investigated the possibility of physical and mathematical description of diffraction of associative-cluster liquid media.

In oxyhydrated gel systems due to the transformation of the gel macromolecules arise the flows of ionic clusters. The movement of clusters can be seen as a movement in the Ratchet-potential. As a result forming of the field of the ever-changing shape with different concentration of clusters and current stochastic vibrational displaing.

The study of oscillating ejection of a current allowed to build three-dimensional graphics on different axes which are located a current difference between two consecutive current values and the difference between two consecutive differences (difference analogs of the first and second derivatives). Typically, these diagram provide a set of points, which is convenient to consider as the vertices of polyhedrals in the space of an electric current and its derivatives. In fact, it is the transition to the phase image of the process.

Based on the assumption that their size is comparable to the wavelength of the light, we examine the change in intensity of the transmitted light, believing that it is caused namely by diffraction.

The performance of consecutive kinetic experiments makes it possible to estimate the maximum size of nanoclusters, which are registered in the system at different wavelengths. The kinetic curves of the change in optical density provide information about the intensity of the processes of structuring gel and the highs in the light absorption curve correspond to a certain standard sizes of clusters.

As a result, it was possible to estimate the size of the colloidal element (250-800 nm) and draw some conclusions about its dielectric properties.

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