

Bifurcational characteristics of the evolving oxyhydrate gel tracked on the experimental material

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Abstract

The colloid-chemical evolution of currents of zirconium oxyhydrate gels self-organization has been studied over the period of 70 days of aging. During the evolution the zirconium oxyhydrate gel undergoes a series of structural changes causing the intensity change of the ion-cluster fluxes acting in oxyhydrate. In addition, the nature of their manifestation often change. According to the characteristics of spontaneous changes in pulsating or spike current over the time (within three months of hydrogel life), on the platinum or graphite electrodes there can be isolated specific time intervals of samples age.

The appearance of spike nanocurrent is caused by bifurcation phenomena due to the destruction of the nano-cluster orbits during the vibrational motion. Creating of attractor albums of periodic motion in oxyhydrate gels allows to analyze the nature of colloidal bifurcations in the experimental system, that is, in the long run, the mechanism of colloid-chemical reactions, which turns out to be different from the conventional one. In the multidimensional parameter space of the oxy-hydrate system, to bifurcation moments there may correspond multitudes, which are points, lines and even surfaces. Thus, tracking the bifurcation moments is an important method for studying the structure of periodic colloidal systems.