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Representation of periodic changes of «noise» viscousity characteristics of helium oxyhydrate systems

© **Yuri I. Sucharev**, **Tatiana I. Prolubnikova**,[1] **Irina I. Lebedeva**, and **Inna Yu. Apalikova**
Department of colloidal and coherent chemistry. Chelyabinsk state university. Bratiev Kashirinyh St, 129. Chelyabinsk, 454000. Russia. Phone: +7 (351) 799-70-63. E-mail: yuri_sucharev@mail.ru

*Supervising author; +Corresponding author

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Abstract

The phase space for flowing gel systems is the strange non-chaotic attractor (SNA), representative for the system with quazi-periodical effect, rational rotation number, not depending on their inner noise parameters. Periodical change of dynamic viscosity of oxyhydrate systems of *d*- and *f*-elements is the result of noise force waves in gel, caused by consecutive growth of polymer gel fragments and their destruction, conformer transitions of the gel fragments, structurization and restructurization of the system in the conditions, which are far from the equilibrium state. For all that, the rheology of the gel is defined by sliding of molecular-cluster flows around the wall of the rotating coaxial cylinder. The reconstruction of the dynamic zirconium oxyhydrate system has been carried out by its reduction in the experimental unvariate time series by the method of time delay. On the basis of stochastic noise periodic oscillations for the first time the likeness of the phase digital molecular force microscope for colloidal systems have been produced, that is the attractors calculated by the author are nothing else but the phase claster representations of macromolecules of zirconium oxyhydrate in the polymerizing colloid-chemical media.

[1] K.I. Nosov also participated in the experiment.