

Analysis of experimental Poincare sections of current spikes of gels of zirconium oxyhydrate

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Keywords: *oxyhydrate gel, optimal delay, pulsating current, double electrical layer, nonequilibrium system, Poincare sections, electrochemical cells, tore motion, tore-chaos, attractor, stochastic oscillations.*

Abstract

Kolloidal-chemical evolution of spontaneous currents of zirconium oxyhydrate gels was investigated over a period of 70 days of ageing. In the course of evolution zirconium oxyhydrate gel undergoes a number of the structural transformations causing the change of intensity of ionic cluster streams operating in the oxyhydrate. Besides, the character of their display often changes. According to the features of SPC change (spontaneous pulsing or spike current) in the course of their life duration (within three months of hydrogel's life), on platinum and graphite electrodes it is possible to allocate conditional time intervals of sample ages.

On graphite electrodes such intervals of gel's ageing are marked out for: (0-15) days, (35-55) days, and for (55-65), (65-72) days for maximum current bumps. The area of relatively low oscillatory bumps corresponds to an interval of 15-35 days. For a graphite cell there is registered the combination of all high current bumps on a platinum cell in one interval (35-55 days) and new current intervals are singled out, namely: (0-8) days (55-65) days and (65-72) days.

Tore instability of zirconium oxyhydrate in all time intervals of ageing was analyzed. Spontaneous motion of zirconium oxyhydrate clusters of three-dimension tore is revealed. This motion on three-dimensional tore also can be considered as one of transition mechanisms to chaos which is realized in oxyhydrate systems constantly. Motion on three-dimensional tore is often simulated by means of reversible displays of an individual square, believing, that the stream section on three-dimensional gel tore generates displays of two-dimensional tore into itself. Phase space of such display is the square with the side equal to unit, representing development two-dimensional tore. These square displays were found out by us. That is, gel oxyhydrate systems, probably, are principally not reproducible.