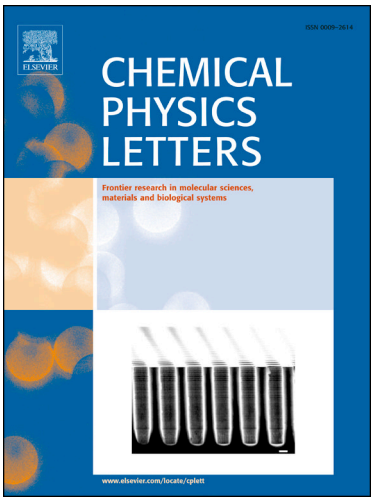

Research paper

Outsized stochasticity of iodine oxidation with hydrogen peroxide and its implications on the reaction mechanism

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Outsized stochasticity of iodine oxidation with hydrogen peroxide and its implications on the reaction mechanism

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Abstract We examined the most interesting subsystem of the Bray-Liebhafsky (BL) oscillator i.e. oxidation of iodine to iodate in acidic media with hydrogen peroxide. The reaction induction periods and formed iodate are characterized by potentiometric method and stopped-flow technique. Introduction of a very slow mixing, at 27^{o}C, increased standard deviation of results to 124 from 2.5 in experiments without mixing. It is confirmed at two lower temperatures. In such (initially) simple chemical system the stochasticity is related with random fluctuations forming critical oxygen cavities. Possible energetic coupling of the nucleation processes with chemical reactions is discussed in connection with previous results.

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