

Numerical simulation of orthosilicic acid polycondensation and colloidal particles growth in hydrothermal solutions

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Abstract

Hydrothermal solutions – nature water mediums which are potential sources of amorphous silica. There is the problem of research of physical and chemical compounds of colloidal silica in hydrothermal solution for development silica extraction and effective methods of using heat carrier. In the frame of this problem there is the task of studying kinetic of orthosilicic acid polycondensation. Polycondensation is one of basic processes in sol-gel technologies for producing materials oxigens including SiO₂. As the result of silicic acid polycondensation in the water silica sol is forming and the particles of sol are growing. Formation of interface surfaces depends on kinetic of process when solutions turns into sols, thus influence on sols properties and structure of materials through initial conditions.