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Hydrothermal synthesis of $\text{NaCa}_2\text{Si}_3\text{O}_8(\text{OH})$ nanowires and its application in Fe(III) ions adsorption

Shaoyan Zhang^{1*}, Cuihong Sun¹, Shengjie Peng² and Linlin Li²

¹ College of Chemical Engineering, Shijiazhuang University, Hebei Province, Shijiazhuang 050035, China, E-mail: zsyedu@hotmail.com.

² Jiangsu Key Laboratory of Materials and Technology for Energy Conversion, College of Materials Science and Technology, Nanjing University of Aeronautics and Astronautics, Nanjing 210016, China,

Abstract

$\text{NaCa}_2\text{Si}_3\text{O}_8(\text{OH})$ nanowires with diameters of 100–150 nm and lengths up to several tens of micrometers have been successfully prepared on a large scale via a simple hydrothermal technique. The growth mechanism and morphology evolution of the $\text{NaCa}_2\text{Si}_3\text{O}_8(\text{OH})$ nanowires were discussed on the basis of the experimental results. The application of the $\text{NaCa}_2\text{Si}_3\text{O}_8(\text{OH})$ nanowires for the removal of Fe(III) ions in water was investigated and the results indicate that the as-prepared $\text{NaCa}_2\text{Si}_3\text{O}_8(\text{OH})$ nanowires showed excellent removal property for Fe(III) ions. Significantly, this is the first time that the $\text{NaCa}_2\text{Si}_3\text{O}_8(\text{OH})$ nanostructures was prepared and used as candidates for adsorbing heavy metal ions.

Keywords: Silicates, Nanowires, Absorbent, Ions adsorption, Nanocrystalline materials

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