

Microwave-Assisted Hydrothermal Synthesis and Annealing of DyF₃ Nanoparticles

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Abstract

© 2016 E. M. Alakshin et al. The series of DyF₃ nanosized samples was synthesized by the colloidal chemistry method. The microwave-assisted hydrothermal treatment was used for the first time for the modification of DyF₃ nanoparticles. Transmission electron microscopy images show that the DyF₃ nanoparticles have average particle size of about 16-18 nm and the size distribution becomes narrower during the microwave irradiation. The X-ray diffraction analysis shows the narrowing of the diffraction peaks versus microwave treatment time. The experimental data demonstrates restructuring of the nanoparticles and their crystal structure becomes closer to the ideal DyF₃ regular structure during the microwave irradiation of colloidal solution. The defect-annealing model of the microwave-assisted hydrothermal modification process is suggested.

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