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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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