

Fr-1 The annealing of PrF₃ nanoparticles by microwave irradiation

E.M.Alakshin, R.R. Gazizulin, A.V. Klochkov, S.L. Korableva, A.M. Sabitova, T.R. Safin, K.R. Safiullin, M.S. Tagirov.

Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Over the last few years PrF₃ nanoparticles have been widely investigated by our group [1-5]. In present work the effect of microwave radiation on the restructuring of nanoscale crystalline PrF₃ powders were researched using nuclear magnetic resonance (NMR), nuclear pseudo quadrupole resonance (NPQR) and high-resolution transmission electron microscopy (HRTEM) methods. It was found that the relaxation times T_1 of the ¹⁴¹Pr and the ¹⁹F nuclei increase along with a duration time of microwave irradiation (Fig. 1), and the line width of the ¹⁴¹Pr spectrum become narrower (Fig. 2). The HRTEM results testify the influence of microwave irradiation time on the size and shape of the PrF₃ nanoparticles.

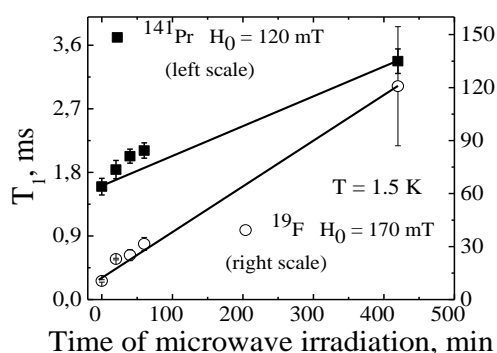


Fig.1 Relaxation time T_1 of ¹⁴¹Pr and ¹⁹F in PrF₃ nanoparticles

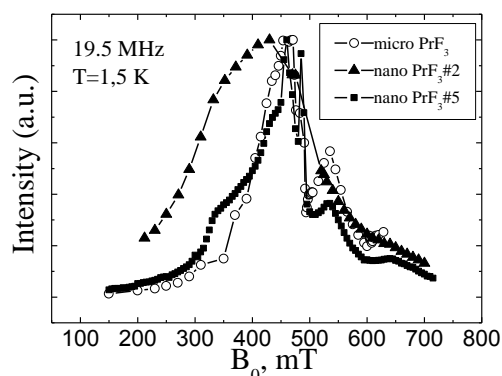


Fig.2 NMR spectra of micropowder PrF₃ and nanopowder samples 2 and 5

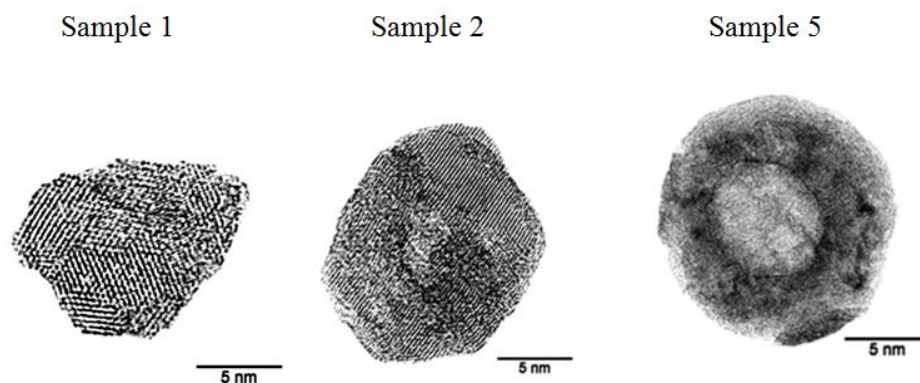


Fig.3 HRTEM images of PrF₃ nanoparticles (samples 1, 2 and 5)

As a result the influence of microwave irradiation on PrF₃ nanoparticles structure was investigated

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