Mössbauer & Nano Symposium 2014

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Effect of the change on site-occupation of Fe ion

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We report crystallographic and magnetic properties for influence of the change on site occupation of Fe ion on inverse spinel $FeGa_2O_4$ by Ni-doped. From the Rietveld's refinement of the X-ray diffraction patterns, the crystal structures are determined to be inverse spinel with space group *Fd-3m*. With increasing Ni concentration, the ratio of magnetic Fe^{2+} cations on A-site[tetrahedron] decreases from 43 to 27 %, and that of B-site[octahedron] increases from 57 to 63 %. Moreover, linear decrease of the lattice constant a_0, and bond length $d_{Ga3+-Fe2+[Ni2+]}$ on B-site[octahedron] was observed with increasing Ni concentration. This suggests that substitution of Ni on $FeGa_2O_4$ is attributed to the Ni^{2+} occupation of the octahedral sites, while Ga^{3+} increases migration in the tetrahedral sites.