

Structural and Magnetic Properties of  $(R_{0.5}A_{0.5})NiO_3$  Perovskites (R = Gd, Yb  
and A = Ce, Th)

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Abstract

Four perovskite compounds with nominal compositions of  $(Gd_{0.5}Th_{0.5})NiO_3$ ,  $(Gd_{0.5}Ce_{0.5})NiO_3$ ,  $(Yb_{0.5}Th_{0.5})NiO_3$  and  $(Yb_{0.5}Ce_{0.5})NiO_3$  were prepared by a polymeric citrate precursor method. They were either slow-cooled in the furnace or quenched to room temperature. All of them have monoclinic symmetry. Quenched samples have a slightly bigger unit cell volume and longer Ni-O bond length, and a smaller grain size than that of the furnace-cooled compounds. All samples are paramagnetic insulators in the range of 2 K to 300 K. The Th containing compounds have larger tolerance factor and Ni(1)-O(1)-Ni(2) bond angle than that of the Ce containing compounds. No mixed valence of Ce, Th and Ni is observed in these samples.