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Evidence of strong disorder in both the ferromagnetic and antoferromagnetic phases of $SrRu_{1-x}Mn_xO_3$ using the Mössbauer Effect[1]
MICHAEL DEMARCO, B. GRAVES, G. HARMON, N. MILLER, D. COFFEY, Dept. of Physics, Buffalo State College, NY 14222, B. DABROWSKI, S. KOLESNIK, M. MAXWELL, Dept. of Physics, Northern Illinois University, Il 60115, S. TOORONGIAN, M. HAKA, Nuclear Medicine Department, SUNY Buffalo, NY 14260 — We investigate the magnetism and disorder in powder samples of $SrRu_{1-x}Mn_xO_3$ and find significant changes in the Mössbauer spectra even at very low values of x. At $x = 0.1$, although the width of the spectrum is consistent with a hyperfine field $\simeq 32T$, which is similar to that of $SrRuO_3$(33T), a single site fit fails, suggesting that there is a range of RuO_6 octahedra distortions. This sensitivity to doping is also seen in the spectrum of $CaRu_{0.8}Cr_{0.2}O_3$ where there is a ∼30T wide distribution of hyperfine fields. At $x = 0.9$ the hyperfine field is due to antiferromagnetic order and is much larger, $50T$, than at $x = 0.9$. The charge state of the Ru atom has also changed from +4 to close to +5. Again the spectrum is not that of a single Ru site in spite of the low density of Ru atoms in the sample.

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