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Comparing the Effects of Varying Carrier Density and Isoelectronic Doping on Magnetic Properties of $SrRuO_3$[1] MICHAEL DE MARCO, RYAN HEARY, DERMOT COFFEY, Dept. of Physics, Buffalo State College, NY, PIOTR KLAMUT, Materials Science Division, Argonne National Lab, IL, MICHAEL MAXWELL, Dept. of Physics, Northern Illinois Univ., PETER MATTOCKS, Dept. of Physics, Fredonia State College, NY, PETER KHALIFAH, Dept. of Chemistry, Univ. of Massachuetts, STEVE TOORONGIAN, MICHAEL HAKA, Nuclear Medicine Dept. SUNY Buffalo, NY — We change the carrier density by introducing Ru vacancies to form $SrRu_{1-v}O_3$ and introduce lattice distortions with the substitution of Ca to form $Sr_{1-x}Ca_xRuO_3$. The hyperfine field falls with increasing x in $Sr_{1-x}Ca_xRuO_3$ and is less than 1T at x=0.8. For all values of x< 0.8 the isomer shift and the quadrupole splitting remain unchanged. This fall in the value of the hyperfine field is consistent with what others have found for T_c. T_c rapidly drops with increasing number of Ru vacancies so that T_c=45K when v=0.12 suggesting that carrier density has a stronger effect on T_c than lattice distortions. The hyperfine field remains unchanged which may be explained by assuming that the polarization of the s-electrons responsible for the hyperfine field is due to localized d-electrons which give rise to the local moment present above T_c.

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