

Abstract Submitted  
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**Experimental Evidence for an Energy Gap in the Magnetic Insulator  $\text{SrRu}_{0.06}\text{Mn}_{0.94}\text{O}_3$** <sup>1</sup> M. DEMARCO, D. COFFEY, Dept. of Physics, Buffalo State College, NY 14222, B. DABROWSKI, S. KOLESNIK, M. MAXWELL, Dept. of Physics, Northern Illinois University, DeKalb, IL 60115, S. TOORONGIAN, M. HAKA, Nuclear Medicine Department, State University of New York, NY 14260 — <sup>99</sup>Ru Mössbauer Effect and magnetic measurements have been made on an enriched <sup>99</sup>Ru sample of  $\text{SrRu}_{0.06}\text{Mn}_{0.94}\text{O}_3$  which are compared with a series of measurements on compounds  $\text{SrRu}_x\text{Mn}_{1-x}\text{O}_3$  made with natural Ru completed earlier.  $\text{SrRu}_x\text{Mn}_{1-x}\text{O}_3$  is an antiferromagnet for  $x=.06$  and a ferromagnet for  $x=.9$ . The change from the ferromagnet to the antiferromagnet is accompanied by a change in the hyperfine magnetic field from 33T to 50T at 4.2K and also an isomer shift from a +4 to close to a +5 charge state. The measurements of the hyperfine field as a function of temperature show a change from 50T at 4.2K to 48T at 105K. Since the Néel temperature is about 160K for this compound, these small changes indicate that the thermal excitation of spin waves, which lead to the decrease of the hyperfine field with temperature, are strongly suppressed by a gap of order 100K in the spin wave spectrum. This indicates the presence of strong magnetic anisotropy in the material.

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