

Abstract Submitted  
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**Determination of complex magnetism in a homologous series of compounds.**<sup>1</sup> R.W. MCCALLUM, Y. JANSSEN, TA. LOGRASSO, K.A. GSCHNEIDNER, JR., V.K. PECHARSKY, B.N. HARMON, Ames Laboratory, Iowa State University, Ames IA 50011 —  $\text{Pr}_{(n+1)(n+2)}\text{Ni}_{n(n-1)+2}\text{Si}_{n(n+1)}$ , where  $n = 2, 3,$  and  $4$ , forms a homologous series of hexagonal compounds whose basic structural unit is a trigonal prism of Pr atoms with its axis parallel to the  $c$ -axis. Between 100 and 400 K, their dc susceptibility,  $\chi_s$  measured with  $\text{H}||c$  and  $\text{H}\perp c$  on a single crystal follows a Curie-Weiss law. In all compounds, the component of  $\text{M}||c$  orders ferromagnetically with  $T_c$  increases with  $n$ . For  $\text{H}\perp c$ , a peak is observed in the low-field  $\text{M}$  vs  $\text{T}$  plots below  $T_c$  suggesting antiferromagnetic order. For  $\text{H}\perp c$  at 5 K, all three compounds exhibit a metamagnetic transition between 2 T and 3 T. Based on the systematics of the properties of the members of the series, a model for site specific interactions has been developed for comparison with first principles calculations.

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