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Muon spin rotation study of perturbation of the crystalline-electric-field induced by interstitial muon in $\text{PrOs}_4\text{Sb}_{12}$ and $\text{PrRu}_4\text{Sb}_{12}$ ¹
LEI SHU, D.E. MACLAUGHLIN, U. of Calif, Riverside, R.H. HEFFNER, Los Alamos National Laboratory, O.O. BERNAL, Calif. State U., Los Angeles, W.P. BEYERMANN, U. of Calif, Riverside, N.A. FREDERICK, W.M. YUHASZ, T.A. SAYLES, T. YANAGISAWA, M.B. MAPLE, U. of Calif, San Diego — Muon spin rotation measurements of the temperature dependence of the positive muon Knight shift in single crystals of $\text{PrOs}_4\text{Sb}_{12}$ and $\text{PrRu}_4\text{Sb}_{12}$ reveal a linear scaling of the Knight shift with the bulk magnetic susceptibility at high temperatures. A small deviation from the linear relation appears in $\text{PrOs}_4\text{Sb}_{12}$ below 6.3 K. However, a large magnitude of deviation is observed in $\text{PrRu}_4\text{Sb}_{12}$ below 32 K. The deviation can be explained by the positive muon induced modification of the susceptibility of neighboring Pr^{3+} ions due to a change of the crystalline-electric-field (CEF) splitting. The data indicate that this modification is much smaller in $\text{PrOs}_4\text{Sb}_{12}$ than in $\text{PrRu}_4\text{Sb}_{12}$. A model calculation based on CEF theory is in progress.

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