Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

Magnetic, Thermodynamic, and Transport Properties of Layered Arsenides $BaRu_2As_2$ and $SrRu_2As_2$ R. NATH, Y. SINGH, D.C. JOHNSTON, Ames Lab. and Dept. of Phys. and Astronm., Iowa State University, Ames, IA 50011, USA — As part of our effort to search for novel superconductors related to the FeAs high-T superconductors, we have synthesized polycrystalline samples of $BaRu_2As_2$ and $SrRu_2As_2$. The magnetic, transport and thermodynamic properties of the samples were investigated by means of magnetic susceptibility $\chi(T)$, electrical resistivity $\rho(T)$, and heat capacity $C_p(T)$ measurements. The temperature dependence of ρ indicates metallic character for both compounds with a residual resistivity ratio $\rho(310\ \mathrm{K})/\rho(2\ \mathrm{K})$ of 17 and 7 for the Ba and Sr compounds, respectively. The $C_p(T)$ results indicate a low density of states at the Fermi level with the low-T Sommerfeld coefficient $\gamma \simeq 4.9$ and 4.13 mJ/mole K^2 for the Ba and Sr compounds, respectively. The Debye temperature Θ_D was estimated to be 270 K and 260 K for the Ba and Sr compounds, respectively. The $\chi(T)$ was found to be diamagnetic with a small absolute value for both the compounds. No evidence for superconductivity, a spin density wave, or a structural transition was observed from the $C_p(T)$ and $\rho(T)$ measurements down to 2 K. However, the $\chi(T)$ data for $SrRu_2As_2$ exhibit a cusp at ~ 190 K, possibly an indication of a structural and/or magnetic transition.
* Supported by the USDOE under contact No. DE-AC02-07CH11358.

Ramesh Nath
Ames Lab. and Dept. of Phys. and Astronm.,
Iowa State University, Ames, IA 50011, USA

Date submitted: 23 Nov 2008 Electronic form version 1.4