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Ternary Superconducting Materials

Low Temperature Heat Capacity of Superconducting Ternary Iron Silicides. C.B. VINING and R.N. SHELTON, Ames Lab.-USDOE* and Dept. of Physics, Iowa State U.--The heat capacity of superconducting ternary rare earth-iron silicides, $Lu_2Fe_3Si_5$(T_c=6.09K), $Sc_2Fe_3Si_5$ (T_c=4.46K) and $Y_2Fe_3Si_5$(T_c=2.15K) is reported for the temperature range 0.5K to 24K. Data for a sample of $Sc_2Fe_3Si_5$ are in good agreement with a simple Debye model, $C=\gamma T+\beta T^3$, from 5K to 15K, which is above the superconducting transition. It is necessary to include a small T^5 term in the heat capacity to properly fit the data above 15K. Analysis of the normal state data yields γ=22.2 mJ/mole-K^2 and a rather large Debye temperature of Θ_D=562K. At 4.46K a jump in the specific heat is observed, $\Delta C/\gamma T_c$=0.76, indicating bulk superconductivity. This jump in the specific heat is smaller than the BSC value of $\Delta C/\gamma T_c$=1.43. Results of measurements on $Lu_2Fe_3Si_5$ and $Y_2Fe_3Si_5$ are also reported.
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( ) Prefer Poster Session
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( ) No preference

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