SPECIFIC HEAT AND MAGNETIZATION FOR THE SEMIMETALLIC Yb_4As_3

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The $S = 1/2$ antiferromagnetic Heisenberg model with the transverse staggered field and uniform magnetic field perpendicular to the staggered field is applied to a semimetallic compound Yb_4As_3. The field - dependent specific heat for infinite and finite chains as well as the magnetization for infinite chains are calculated by the numerical quantum transfer-matrix method. Specific heat data for polydomain samples Yb_4As_3 and $(Yb_{0.99}Lu_{0.01})_4As_3$ at $B = 12T$ are presented and compared with numerical results obtained for microscopic parameters taken from theoretical predictions. Magnetization experimental data for a single domain and polydomain sample Yb_4As_3 are also compared with our simulation results.

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