Abstract Submitted
for the MAR06 Meeting of
The American Physical Society

Comparative analysis of specific heat of YNi_2B_2C using nodal and two-gap models HUNG DUEN YANG, CHIEN LUNG HUANG, Department of Physics, National Sun Yat-Sen University, Kaohsiung 804, Taiwan, JIUNN YUAN LIN, Institutre of Physics, National Chiao-Tung University, Hsinchu 300, Taiwan, CHIA PIN SUN, Department of Physics, National Sun Yat-Sen University, Kaohsiung 804, Taiwan, TING KUO LEE, Institute of Physics, Academia Sinica , Nankang 11592, Taiwan, SUNG IK LEE, National Creative Research Initiative Center for Superconductivity and Department of Physics, Pohang University of Science and Technology, Pohang, 794 — The magnetic field dependence of low temperature specific heat in YNi_2B_2C was measured and analyzed using various pairing order parameters. At zero magnetic field, the two-gap model which has been successfully applied to $MgB_2$and the point-node model, appear to describe the superconducting gap functionof YNi_2B_2C better than other models based on the isotropic s-wave, the d-wave line nodes, or the $s+g$ wave. The two energy gaps, Δ_L=2.67 meV and Δ_S=1.19 meV are obtained. The observed nonlinear field dependence of electronic specific heat coefficient, $\gamma(H) \sim H^{0.47}$, is quantitatively close to $\gamma(H) \sim H^{0.5}$expected for nodal superconductivity or can be qualitatively explained using two-gap scenario. Furthermore, the positive curvature in $H_{c2}(T)$ near T_c is qualitatively similar to that in the other two-gap superconductor MgB_2.

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Date submitted: 11 Jan 2006 Electronic form version 1.4