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Crystalline Electric Field Effect in $Ho_{1-x}Dy_xNi_2B_2C$ System. W.C. LEE, Dept. of Physics, Sookmyung Women's Univ. — We have measured magnetization curves of $Ho_{1-x}Dy_xNi_2B_2C$ (x = 0.0, 0.1, 0.3, 0.6, 1.0) single crystals at various temperatures with the applied magnetic fields up to 20 kG where Neel and superconducting temperatures (T_N, T_C) ratio, T_N/T_C, varies from 0.73 to 1.66 for x= 0.0 and 1.0. All measurements show some not linear behaviors in magnetization versus applied magnetic fields at low temperature regions. From the theoretical analysis of I4/mmm group symmetry in structure with the energy level pictures of CEF (crystalline electric field) effect of magnetization isotherms anisotropy at various temperatures, we have obtained ground state energy states in D_{4h} singlet Γ_4 and first excited doublet state Γ_5 in addition to excited Γ_1. Current CEF energy level analysis shows some qualitative agreement between theoretical calculation and experiments only at high magnetic fields regime, which means the interplay between magnetism and superconductivity may be considered.

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