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Magnetic Anisotropy and Crystalline Electric Field in Quaternary Intermetallic Compounds.[1] W. C. LEE, Dept. of Physics, Sookmyung Women's Univ. Seoul 140-742 — All isostructural compounds RNi_2B_2C (R=Er, Ho, Dy) show some magnetic transitions in magnetization isotherms at certain applied magnetic fields and temperatures above and below Neel and superconducting temperatures (T_N, T_C) where T_N/T_C varies from 0.57 to 1.66 for $ErNi_2B_2C$ and $DyNi_2B_2C$. By using theoretical group analysis of D_{4h} (I4/mmm) to the energy level scheme of crystalline electric field of magnetization isotherms anisotropy at various temperatures, we have obtained some possible ground state energy levels such as singlet Γ_4 and first excited doublet state Γ_5 in addition to another excited singlet Γ_1. Our crystalline electric field energy scheme analysis shows some qualitative agreement between theoretical calculation and experiments at high magnetic fields regime only, which means the interplay between antiferromagnetsm and superconductivity should be included.

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