Magnetic Anisotropy and Crystalline Electric Field in Quaternary Intermetallic Compounds.\textsuperscript{1} W. C. LEE, Dept. of Physics, Sookmyung Women’s Univ. Seoul 140-742 — All isostructural compounds RNi$_2$B$_2$C (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$_2$B$_2$C and DyNi$_2$B$_2$C. 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 $\Gamma_4$ and first excited doublet state $\Gamma_5$ in addition to another excited singlet $\Gamma_1$. 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 antiferromagnetism and superconductivity should be included.

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