

\textbf{\textsuperscript{11}B Pulsed NMR Study of DyNi$_2$B$_2$C Single Crystals} MOOHEE LEE, SE-GEUN KWON, KIHYEOK KANG, Konkuk University, Republic of Korea, BEONGKI CHO, Gwangju Institute of Science and Technology, Republic of Korea

DyNi$_2$B$_2$C is the only compound in the RNi$_2$B$_2$C (R = rare-earth) series where superconductivity at $T_c \approx 6.2$ K coexists with the antiferromagnetic ordering below the Nel temperature $T_N \approx 10.3$ K. \textsuperscript{11}B pulsed NMR measurements were performed at 8.0056 T to investigate the local electronic structures and $4f$ spin dynamics of DyNi$_2$B$_2$C powders and single crystals. The spectrum for the single crystal showed three narrow resonance peaks at 295 K due to the nuclear Zeeman splitting of a nuclear spin $I = 3/2$ with quadrupolar perturbation. The \textsuperscript{11}B NMR Knight shift of the single crystal was very large and highly anisotropic at $K = -0.60\%$ and $+0.27\%$ for the fields parallel and perpendicular, respectively, to the $c$-axis at 295 K. Considering the anisotropy of the Knight shift, we were able to simulate the \textsuperscript{11}B NMR power pattern that agreed well with the measured spectrum. The linewidth was also large and anisotropic, and the linewidth value increased rapidly at low temperatures. The \textsuperscript{11}B NMR shift and linewidth were found to be proportional to the magnetic susceptibility, indicating that the hyperfine field at the B site originates from the $4f$ spins of Dy. Above $T_N$, the values for $1/T_1$ and $1/T_2$ were very large, showing slight increases at low temperatures. Below $T_N$, the values of $1/T_1$ and $1/T_2$ were suppressed significantly because of the slowing of the $4f$ spin fluctuation. This confirmed the huge change in Dy $4f$ spin dynamics across the antiferromagnetic transition.

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