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Pressure effect on ferroelectricity of multiferroic $Ho_{0.5}Nd_{0.5}Fe_3(BO_3)_4$[1] NARAYAN POUDEL, MELISSA GOOCH, BERND LORENZ, TcSUH and Department of Physics, University of Houston, L. N. BEZMATERNYKH, V. L. TEMEROV, Institute of Physics, Siberian Division, Russian Academy of Sciences, C. W. CHU, TcSUH and Department of Physics, University of Houston, Lawrence Berkeley National Laboratory, Berkeley, CA — $Ho_{0.5}Nd_{0.5}Fe_3(BO_3)_4$ becomes multiferroic below 33 K where it enters into the AFM1 phase and gives rise to a ferroelectric polarization along the a-axis. At 9.5 K, the polarization drops sharply and remains finite value of ~ 40 $\mu C/m^2$. This is due to the spin rotation from the a-b plane into the c-axis and gives rise to the AFM2 phase. The application of pressure suppresses the AFM2 phase and moves the spin rotation transition from 9.5 K to 4.8 K up to pressure of 18.8 kbar which is observed in both dielectric and pyroelectric measurements. The change in magnetic anisotropy of rare-earth moments and Fe ions under pressure drives the spin rotation transition of rare-earth at lower temperature.

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