Recently we found a new geometric frustration system Cu2(OH)3Cl and Co2(OH)3Cl with a 3-dimensional network of corner-sharing tetrahedrons of the Cu2+ and Co2+ spins, respectively 1-3. We found coexisting antiferromagnetic order and spin fluctuation in Cu2(OH)3Cl 2, and a kagome-ice-like partial ferromagnetic order in Co2(OH)3Cl 3, which raise great interest on this new material system. Further, we proceeded to investigate the magnetic structures in other transition metal hydroxyhalide compounds Ni2(OH)3Cl, Mn2(OH)3Cl, and Mn2(OH)3Br.

Neutron diffraction experiment was carried out at T1-3 (Hermes) using powder sample of Ni2(OD)3Cl, Mn2(OD)3Cl, and Mn2(OD)3Br. Strong magnetic reflections were observed for Ni2(OD)3Cl, Mn2(OD)3Cl, and Mn2(OD)3Br, respectively, at low temperatures. They agree well with antiferromagnetic transitions observed with magnetic susceptibility measurements at TN = 5 K, TN = 3.4 K and TN = 3.3 K, respectively, for Ni2(OD)3Cl, Mn2(OD)3Cl, and Mn2(OD)3Br. Determination of their respective magnetic structures are in progress.

References