Geometrically frustrated magnetism usually found in kagome, triangular, and pyrochlore lattice has received a lot of attention because of exotic ground states. Geometrical frustration leads to degeneracy, enhances spin fluctuations and suppresses magnetic long range ordering (LRO) [1-2]. Recently, spin liquid, partially frozen state with persistent spin fluctuation, and ordered state are found in ZnCu$_3$(OH)$_6$Cl$_2$ [3], Co$_3$Mg(OH)$_6$Cl$_2$ [4], and MgFe$_3$(OH)$_6$Cl$_2$ [5] kagome compounds, respectively. Beside spin-liquid state in low spin system, high spin classical or quasi-classical kagome antiferromagnets are of much interest. Here, we briefly describe the growth and magnetic characterization of S=5/2 kagome compound MgMn$_3$(OH)$_6$Cl$_2$. Polycrystalline MgMn$_3$(OH)$_6$Cl$_2$ compound was synthesized by solvothermal reaction of MgCl$_2$, 6H$_2$O, MnCl$_2$. 4H$_2$O and NaOH in water-ethanol solution in N$_2$ atmosphere at high temperature. The compound was subject to x-ray diffraction (XRD), dc magnetic, and neutron powder diffraction experiments. The refined XRD data confirmed that the MgMn$_3$(OH)$_6$Cl$_2$ compound crystallizes in the rhombohedral structure with space group R-3m, with magnetic ions in the triangular planes almost completely replaced by non-magnetic Mg$^{2+}$ shown in Fig. 1. The susceptibility measurement showed antiferromagnetic transition $T_N$ at 7.9 K as presented in Fig. 2.

The experimentally estimated values of Curie-weiss temperature ($\theta_{CW}$), curie constant (C), and effective magnetic moment ($\mu_{eff}$) are -47 K, 3.61 emu K mol$^{-1}$, and 5.4 $\mu_B$ per Mn$^{2+}$ spin. Neutron diffraction experiment confirm long-range antiferromagnetic order developed below 8 K in MgMn$_3$(OD)$_6$Cl$_2$ compound.

References
[2]. S. Chu, T. M. McQueen, R. Chisnell, and et al., JACS Comm., DOI: 10.1021/ja1008322.