Structures and magnetic properties of $A_2\text{CoOsO}_{6-x}$ (A=Ca and Sr)

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Double perovskite $A_2\text{CoOsO}_{6-x}$ (A=Ca and Sr) have been prepared in polycrystalline form by using high pressure (6GPa) method. These new materials have been studied by X-ray diffraction (XRD), TGA, magnetic susceptibility and magnetization measurements, and resistivity measurement. The room-temperature crystal structures are monoclinic ($P2_1/n$) for $\text{Ca}_2\text{CoOsO}_{6-x}$ and tetragonal ($I4/m$) for $\text{Sr}_2\text{CoOsO}_{6-x}$, and contain alternating of $\text{CoO}_6$ and $\text{OsO}_6$ octahedral. The magnetic measurements show a ferromagnetic order at about 150K for $\text{Ca}_2\text{CoOsO}_{6-x}$ and an antiferromagnetic order at about 104K for $\text{Sr}_2\text{CoOsO}_{6-x}$.

Temperature dependence of magnetic susceptibility of $\text{Ca}_2\text{CoOsO}_{6-\delta}$.