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Spin Glass Behavior in the new cobaltite series $(BaSr)_{4-x}La_xCo_4O_{15}$. OVIDIU GARLEA, RONGYING JIN, RADU CUSTELCEAN, Oak Ridge Natl. Lab., HAO SHA, Florida International University, JIANDI ZHANG, Florida International University and Louisiana State University — We report on the structural and magnetic properties of a new class of cobaltites with the chemical formula $(BaSr)_{4-x}La_xCo_4O_{15}$. These compounds crystallize in a hexagonal structure, where Co ions occupy two different sites with octahedral and tetrahedral oxygen environments. Four Co ions of the unit cell define the vertices of a tetrahedron and their mutual antiferromagnetic superexchange interactions are topologically frustrated. Partial substitution of Sr and Ba atoms for La allows one to adjust the degree of Co valence mixing and finely tune their magnetic interactions. A strong irreversibility between FC and ZFC magnetizations and the absence of magnetic reflections in the neutron diffraction patterns suggest a spin glass-like ground state for all the compositions.

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