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Magnetic phase separation in $SrCoO_{2.5+x}$[1] CHANGKUN XIE, YUEFENG NIE, BARRETT WELLS, JOSEPH BUDNICK, WILLIAM HINES, University of Connecticut, BOGDAN DABROWSKI, Northern Illinois University — We study phase separation and inhomogeneities induced by oxygen non-stoichiometry in $SrCoO_{2.5+x}$. In previous work [A. Nemudry, et. al. Chem. Mater. 8, 2232(1996)], it has been shown that as oxygen is driven into the $SrCoO_{2.5}$electrochemically, the material structurally separates into two different phases: one is antiferromagnetic $SrCoO_{2.5}$, and the other is ferromagnetic $SrCoO_{2.75}$. We show that two distinct ferromagnetic phases appear for $SrCoO_{2.88}$ and $SrCoO_3$, with T_c = 220 K and 280 K, respectively. The phase diagram of $SrCoO_{2.5+x}$ suggests the four magnetic line phases are the only stable ground states in the system. While antiferromagnetic $SrCoO_{2.5}$ is orthorhombic, the three ferromagnetic phases are pseudo-cubic and, unlike the magnetic properties, do not show the coexistence of different structures. The existence of distinct T_c=220 K and T_c=260 K magnetic phases with no structural differentiation indicates the presence of magnetic phase separation.

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