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Pronounced increase of the thermopower in Na_xCoO_2 in the large-x regime ($x \geq$0.75) MINHYEA LEE, Physics Department, Princeton Univerisity, LILIANA VICIU, Chemistry Department, Princeton Univerisity, LU LI, YAYU WANG, Physics Department, Princeton Univerisity, M. L. FOO, S. WATAUCHI, R. A. PASCAL JR., R. J. CAVA, Chemistry, Princeton Univerisity, N. P. ONG, Physics, Princeton Univerisity — We report for the first time the systematic transport study on high doped Na_xCoO_2 over series of samples which lie ($0.75 \leq x \leq 1$). We discovered two distinctive regions of phase diagram exist in high Na doping level : one is characterized by largely enhanced thermopower (200 – 300 μV/K at $\sim$ 130K) yet highly metallic resistivity in $0.75 \lesssim x \lesssim 0.88$ (region I). The other (region II) is emerged in $0.89 \lesssim x \lesssim 0.97$, in which the electronic phase is mixed with the region I phase and $x = 1$ of non-conducting end compound and the mixture seems to occur mainly along the layer. We will discuss the newly revised phase diagram of the high Na part and speculate on a relation to the characteristics of Na layer.

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