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Itinerant correlated electrons on 2D and 3D triangular lattices M. BRUEHWILER, ETH Zuerich, Switzerland, S. M. KAZAKOV, J. KARPINSKI, B. BATLOGG — In insulating frustrated systems, where localized magnetic moments sit on the vortices of e.g. triangles or tetrahedra, competing interactions lead to a wealth of novel states of fundamental interest. Ground states of infinite degeneracy are a typical signature of such frustrated systems. While for local moments the intimate connection between spin and the lattice leads to the observed frustration effects, it is an open question to what degree itineracy modifies these features and how charge, spin, and lattice degrees of freedom are affected. In this context, the superconductivity recently discovered in 2D triangular $Na_xCoO_2 - yH_2O$ and 3D triangular AOs_2O_6 (A = K, Rb, Cs) is of considerable interest. In order to shed light onto the above mentioned questions associated to these materials, we have performed thermodynamic and transport measurements on both the parent compound of the hydrated superconductor, Na_xCoO_2, and the pyrochlores KOs_2O_6 (T_c = 9.5 K) and $RbOs_2O_6$ (T_c = 6.4 K). We have mapped out parts of the phase diagram as a function of band filling of Na_xCoO_2 (varying Na content x) and find peculiar low-energy excitations below about 10 K. In the 3D system, we also find a significant mass enhancement by factors up to about 8 compared to band structure calculations, part of which can be attributed to electron-phonon interaction (λ_{ep} = 1 to 1.5).

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