Title:	Chemical tuning between triangular and honeycomb structures in a 5d spin-orbit Mott insulator
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Abstract:	We report structural studies of the spin-orbit Mott insulator family K x Ir y O 2 , with triangular layers of edge-sharing IrO6 octahedra bonded by potassium ions. The potassium content acts as a chemical tuning parameter to control the amount of charge in the Ir-O layers. Unlike the isostructural families with Ir replaced by Co or Rh (y=1), which are metallic over a range of potassium compositions x, we instead find insulating behavior with charge neutrality achieved via iridium vacancies, which order in a honeycomb supercell above a critical composition xc. By performing density functional theory calculations we attribute the observed behavior to a subtle interplay of crystal-field environment, local electronic correlations, and strong spin-orbit interaction at the Ir4+ sites, making this structural family a candidate to display Kitaev magnetism in the experimentally unexplored regime that interpolates between triangular and honeycomb structures.
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