## Phase diagram in high-Tc iron pnictide and chalcogenide superconductors

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We will talk about crystal, magentism and superconductivity in R1-xFe2-ySe2 (R=K, Rb, Cs, Tl/K and Tl/Rb). We present the resisitivty and magnetization as a fuction of temperature up to 600 K, and the strucure from room temperature to 20 K. We established a detailed electronic and magnetic phase diagram of KxFe2-ySe2 system as a function of Fe valence. We find two AFM insulating phases and reveal that the superconducting phase is sandwiched between them, and give direct evidence that the superconductivity in AxFe2-ySe2 originates from the AFM insulating parent compounds. The two insulating phases are characterized by two distinct superstructures caused by Fe vacancy orders with modulation wave vectors of q1=(1/5, 3/5, 0) and q2=(1/4, 3/4, 0), respectively. These experimental results strongly indicate that iron-based superconductors and cuprates share a common origin and mechanism of superconductivity. We will argue whether the superconductivity and antiferromagneism coexist in in R1-xFe2-ySe2 system. For comparison, we also talk about the electronic phase diagram in Sm-1111 and Ba-122 system. The coexistence of superconductivity and spin-density-wave is observed in Sm-1111 and Ba-122 system. We show you the contrasting behavior between the region with coexistence of superconductivity and spin-density-wave and the region without the spin-density-wave ordering by high pressure, structure, high-magnetic field and muSR measurements.

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