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EVOLUTION OF MAGNETISM IN UCo 1-x Ir x Ge SYSTEM

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The uranium based intermetallics are intensively studied because of dual character of uranium 5f electrons. Unique coexistence of ferromagnetism and superconductivity has been revealed in URhGe and UCoGe crystalizing in the orthorhombic TiNiSi-type structure. Since UCoGe (T C =2.5 K) is very close to magnetic instability, it is a candidate to observe vanishing of ferromagnetic order and ferromagnetic quantum critical point. The chemical substitution was found as an effective tool to destabilize the ferromagnetic order in UCoGe by substitution on Co site by transition metal. UCo 1-x Ru x Ge or UCo 1-x Fe x Ge systems have showed vanishing of ferromagnetism in quantum critical point at critical concentration ⊠30 % of substituent element. However, in UCo 1-x Rh x Ge or UCo 1-x Pd x Ge where both parent compounds order magnetically, finite ordering temperature is conserved, thus quantum critical phenomena have not been observed.
We have decided to investigate UCo 1-x Ir x Ge system. Since UCoGe is ferromagnet and UIrGe antiferromagnet, its alloy system is promising candidate to observe interesting evolution of magnetism. We will show that UCo 1-x Ir x Ge is the first case of disappearance ordering temperature between two magnetic parent compounds. Therefore, two quantum critical point of different nature of ferromagnetic and antiferromagnetic-type are expected.
In order to investigate evolution of the magnetism we have prepared polycrystalline samples throughout whole concentration range. Subsequently, we have performed measurements of magnetization, electrical resistivity and heat capacity.

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