COLLOQUIUM

Correlated Electron State in $Ce_{1-x}Yb_xCoIn_5$ Stabilized by valence fluctuations

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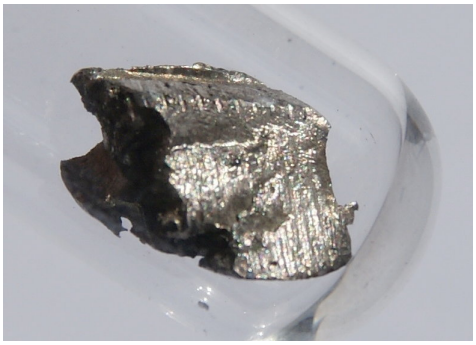

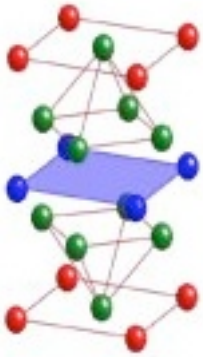

Abstract

A great deal of research has been done on the properties of rare-earth metals and their compounds. In this talk, I will discuss a large subclass of these materials which are referred to as intermediate valence compounds and sometimes as fluctuating-valence compounds. Recently, intermediate valence phenomena has been found in the $Ce_{1-x}Yb_xCoIn_5$ system. X-ray diffraction, electrical resistivity, magnetic susceptibility, and specific heat measurements reveal that many of the characteristic features of the x=0 correlated electron state are stable for $0 \leq x \leq 0.775$, and that phase separation occurs for $x > 0.775$. The stability of the correlated electron state is apparently due to cooperative behavior of the Ce and Yb ions, involving their unstable valences. Low temperature Non-Fermi liquid (NFL) behavior is observed which varies with x, even though there is no readily identifiable quantum critical point. The NFL state is tuned by valence fluctuations.

3-4 p.m., Friday, Sep. 30, 2011

McLane Hall 162

Refreshments will be served. All welcome!