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$_x$CoIn$_5$ 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 ≤ x ≤ 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.