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Contribution ID: 138

Type: **Poster Presentation**

Magnetic substitution in $\text{CePt}_{2}\text{Si}_{2}$ and CeCu_{5}In Kondo lattice compounds

Tuesday, 10 July 2012 17:30 (2 hours)

Abstract content
 (Max 300 words)

Magnetic substitution in $\text{CePt}_{2}\text{Si}_{2}$ and CeCu_{5}In is reported through x-ray diffraction (XRD), electrical resistivity $\rho(T)$, magnetic susceptibility ($\chi(T)$) and magnetization ($\sigma(\mu_0H)$) measurements. XRD results indicate a tetragonal $\text{CaBe}_{2}\text{Ge}_{2}$ -type structure with space group $P4/nmm$ for all compositions of the $(\text{Ce}_{1-x}\text{D}_{yx})\text{Pt}_{2}\text{Si}_{2}$ system, while for the $(\text{Ce}_{1-x}\text{Tb}_x)\text{Cu}_{5}\text{In}$ system, XRD indicates an orthorhombic CeCu_{6} -type structure with space group $Pnma$ up to 60% Ce substitution. $\rho(T)$ results for both alloy systems indicate evolution from coherent Kondo lattice to incoherent single-ion Kondo behaviour. $\chi(T)$ data follow the Curie-Weiss (CW) relation for all investigated compositions at high temperatures, given effective moment values (μ_{eff}) which increase gradually from the expected value of $2.54 \mu_B$ for Ce^{3+} -ion to the expected value of $10.65 \mu_B$ for Dy^{3+} -ion, in the $(\text{Ce}_{1-x}\text{D}_{yx})\text{Pt}_{2}\text{Si}_{2}$ system, while for the $(\text{Ce}_{1-x}\text{Tb}_x)\text{Cu}_{5}\text{In}$ system an increase of μ_{eff} was observed with an increase in Tb content x . For all two systems, no magnetic transition was observed down to 2K. $\sigma(\mu_0H)$ data indicates a linear behaviour up to 1T and followed by a strong curvature above 1T for the two alloy systems. In the $(\text{Ce}_{1-x}\text{Tb}_x)\text{Cu}_{5}\text{In}$ system an increase of μ_{eff} was observed with an increase in Tb content x . For all two systems, no magnetic transition was observed down to 2K. $\sigma(\mu_0H)$ data indicates a linear behaviour up to 1T and followed by a strong curvature above 1T for the two alloy systems.

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Session Classification: Poster Session

Track Classification: Track A - Division for Condensed Matter Physics and Materials