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Intermediate valence and antiferromagnetic Kondo lattice behaviour in Ce(Au_{1x}Ni_x)₂Si₂.

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The transition from intermediate valence (IV) behaviour in CeNi₂Si₂ to magnetically ordered Kondo lattice behaviour in CeAu₂Si₂ is investigated through measurements of X-ray diffraction (XRD), electrical resistivity rho(T), magnetization sigma(μ <sub>(sub>0H) and magnetic susceptibility chi(T) on the polycrystalline Ce(Au_{1-x}Ni_x)₂Si₂($0 \le x \le 1$) alloy series. Lattice parameters as derived from XRD measurements deviate from Vegard's rule around x = 0.6 – 0.8. rho(T) data indicate Kondo lattice behavior in the presence of a crystal field for x ≤ 0.6, the occurrence of magnetic ordering for x = 0 and fluctuating valency for x ≥ 0.8. chi(T) data at high temperatures, follow the Curie-Weiss relation for alloys in the concentration 0 ≤ x ≤ 0.6 (Kondo lattice region) and give effective magnetic moment values μ _{eff} close to that expected for the free Ce<sup>

3+</sup>-ion. The low temperature chi(T) data indicate the onset of antiferromagnetic ordering for $x \le 0.78$. For alloys in the concentration range $0.8 \le x \le 1$ (IV region), chi(T) data are described within the framework of the paramagnon model. sigma(μ ₀H) measurements indicate metamagnetic behavior for alloys in the concentration range $0 \le x \le 0.1$.

Level (Hons, MSc,
 PhD, other)?

Other

Consider for a student
 award (Yes / No)?

No

Would you like to
 submit a short paper
 for the Conference
 Proceedings (Yes / No)?

No

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