BAND GAP STABILITY IN KONDO INSULATORS

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9.7 cm

We report on magnetic measurements and electronic structure investigations of CeNiSn and CeRhSb. Both belong to the group of Kondo insulators. The magnetic susceptibility shows the nonmagnetic ground state for these compounds and their alloys. The $3d$ x-ray photoemission spectroscopy spectra show evidence for the mixed valence state of Ce in CeRhSb alloys, as also seen for CeNiSn, whereas the spectra for the La substituted (Ce,La)NiSn compounds show only evidence for a pure Ce^{3+} ground state. We suggest the presence of Kondo-hole states in (Ce,La)RhSb. The location of the pseudogap in CeRhSb varies with the number of free electron, the valence of Ce, and the $f-d$ hybridization. We discuss the similar crystallographic properties and the closed electronic structures of ZrNiSn-type semi-Heusler alloys and CeNiSn-type Kondo insulators.

13.4 cm

Subject category :

1. Correlated Electrons and High Temperature Superconductors

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