

Title: Variations of actinide magnetism in uranium-base hydrides and other selected systems.

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Abstract: Actinide magnetism was studied in three different types of systems. Variations of magnetic properties of UTGe hydrides as a function of hydrogen concentration prove that doping of U intermetallics by interstitial hydrogen leads to stronger magnetic properties, primarily caused by an increase of the inter-uranium separation. Sputter-deposited UFe_{2+x} films, which are derived from the UFe_2 Laves phase but have an amorphous structure, exhibit an increase of the Curie temperature (to more than 400 K) with the Fe excess, which could not be achieved in the bulk. This is understood as a result of the prominent role of the 3d magnetism of Fe. Notoriously weakly magnetic plutonium was studied in the form of the alloy in the ζ -phase, which exists between 35 and 70 % U in Pu. Its susceptibility increases in a comparison to pure Pu phases, but local magnetic moments are not formed. It proves that the volume is not the primary control parameter affecting the situation around the Fermi level of Pu phases.

Keywords: uranium compounds, crystal structure, magnetic properties, hydrogen absorption, amorphous films, plutonium