

Role of crystallochemistry on investigation of Ce and Yb intermetallic compounds

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In recent years a growing interest has been devoted to investigate strongly correlated electron systems, where hybridization of f-electrons and conduction electrons can cause a number of outstanding low temperature features. Among the rare earths, a large number of these phenomena is found in Ce- and Yb- based compounds and alloys. Chemical composition, as well as pressure and magnetic field, can play an important role in ground state properties of these compounds. Regarding the influence of chemical composition on physical properties of intermetallic compounds, an important question to be addressed is whether the compound is a point compound with a fixed composition or it forms in a homogeneity range. In the first case it may be worth investigating the effect of doping with other metals, whereas in the second case an investigation of the homogeneity range is an important prerequisite in order to perform a careful investigation of ground state properties. In fact, it may happen that compounds previously thought to be stoichiometric are later on recognized to be point of crystallographic order of solid solutions.

In this talk a few examples of compounds, which have been recently investigated within the framework of the European COST action ECOM (Emergent Behaviour of Correlated Matter), are discussed, with the aim to stress the importance of crystallochemistry and compositional phase diagrams for the challenging activity of synthesis and characterization of novel promising strongly correlated electron intermetallic compounds.