Magnetism in TmCo₂

J. Šebesta, 1 J. Prchal, 1 J. Valenta, 1 M. Kratochvílová, 1 and V. Sechovský 1

1 Charles University in Prague, Faculty of Mathematics and Physics, Department of Condensed Matter Physics, Ke Karlovu 5, 121 16 Praha 2

Magnetic properties of RCo₂ compound has been subject of studies already in the second half of last century. However, in recent years these materials are becoming interesting again because of new magnetic state - called “parimagnetism” recently discovered in RCo₂ ferrimagnets (R∈{Gd, . . . , Tm}) in the paramagnetic range. The parimagnetism is explained like a short-range anti-parallel coupling between magnetization of Co clusters and rare-earth magnetic moments. The importance of TmCo₂ compound comes from its position at the end of the series of ferrimagnetic compounds. There exist discrepancies in the literature concerning a behavior of Co magnetism. As a results of a set of several experiments we obtain two characteristic temperatures. One at Tₐₙₙ=3,5 K corresponding to first order magnetic phase transition and another at 35 K connected with parimagnetic configuration totally independent on external hydrostatic pressure. We will present experimental data evidencing the exceptionality of TmCo₂. It is a special case among the family of RCo₂ compounds with respect to relation of the characteristic temperatures. These temperatures are moreover almost independent on the applied hydrostatic pressure.