Magnetic properties of Dy$_3$Pd$_2$ single crystal

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The R$_5$Pd$_2$ compounds were investigated by Berkowitz et al. [1]. They reported the existence of four new R$_5$Pd$_2$-type (R=Gd, Tb, Dy, Ho) compounds. All these compounds crystallize in the cubic Dy$_5$Pd$_2$ - type of crystal structure which belongs to the space group Fd$ar{3}$m [2]. Recently, the magnetic properties of R$_5$Pd$_2$ (R=Tb, Dy, Ho, Er) intermetallic compounds were carried out [3]. The samples were obtained in polycrystalline form by the induction melting. The electrical resistivity, ac and dc magnetic susceptibility measurements show a complex transport and magnetic behaviour of these compounds mainly due to the frustration effect. The aim of this work was to obtain a good quality single crystal of Dy$_3$Pd$_2$, parameter thermal variation and magnetic measurements. Fig. 1 shows the X-ray Berg-Barrett topography of the Dy$_3$Pd$_2$ single crystal, grown by the Czochralski method from a levitated melt, witch confirms good quality of the obtained crystal. This compound crystallized in the cubic Dy$_3$Pd$_2$ - type of crystal structure. The lattice parameter was $a$=13.52 Å.

![Fig. 1. Berg–Barrett topography of Dy$_3$Pd$_2$ single crystal.](image)

The temperature dependence of the unit cell volume $V$ of Dy$_3$Pd$_2$ was measurement. The unit cell volume $V$ decrease linearly from 300 down to 50 K. Below this temperature the unit cell volume keeps almost constant values down to 10 K.


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