

Assessment on Mgr. Jiří Kaštil

Jiří Kaštil started to study the magnetocaloric effect already in his bachelor work and continued in diploma work and finally during his PhD studies. The work was done in a strong collaboration with the Institute of Physics where Jiří Kaštil actively participated in construction and tests of the system for direct measurement of the magnetocaloric effect. He also participated in construction of a real cooling device that uses the magnetocaloric effect. In the last year, Jiří Kaštil spent almost one year in CNRS Grenoble continuing to study the materials presented in his thesis.

The PhD thesis comprises studies of magnetocaloric properties of several different materials. First group involves intermetallic compound TbNiAl and its substitutions – Tb by Y and Al by In. These compounds were chosen to illustrate the development of magnetic properties in the studied series. TbNiAl was studied in the form of both polycrystal and single crystal, showing a large anisotropy of the magnetocaloric effect. It thus outlines an interesting application possibility – rotate the sample instead of rotating the magnet. Further studied compounds exhibit large magnetocaloric effect close to the room temperature. Here, the usual indirect measurements of magnetocaloric effect as magnetization and heat capacity are compared with the direct measurement of the temperature change. Several different types of materials were investigated – rare-earth intermetallic compounds, Heusler alloys or metallic glass. I appreciate his critical approach when analyzing limits and applicability of each method. The results presented in his thesis Jiří Kaštil presented in 10 original papers in peer-reviewed journals and on several international conferences.

Beside the work on the subject presented in his thesis, Jiří Kaštil very actively participated in many other research activities. Therefore, he is a co-author of several other scientific papers. I appreciate also his friendly character which contributes to a positive atmosphere in the lab.

I believe that he will successfully defend his PhD thesis and will continue in research activities.

Prague, 10.8. 2014

Doc. Pavel Javorský. Dr.