



The evaluation of the PhD Thesis of Mr. Qilin Cheng "Novel Nanocomposites with Controllable Structure: Synthesis and Electrorheological Behaviour" submitted to the Faculty of Technology, Tomas Bata University in Zlin, Czech Republic.

The Thesis is based on three papers published in international journals and two manuscripts. The topic is oriented on the preparation and testing of novel types or suspensions for electrorheology. The theme of the Thesis is scientifically interesting and potentially useful in practical applications. The use of nanotubes and the excursion to the realm of nanostructures makes the results even more attractive to the scientific community. The overall impression and evaluation of the Thesis is definitely positive. The Thesis has also been well prepared from the technical point of view, illustrating the dedication of the candidate to the presentation of the results.

I have practically no critical comments, and only some points could be briefly discussed during the defense of the Thesis to make some points more clear:

- (1) What is the meaning of the symbol η_c in the Figure 6, and what type of poly(methyl methacrylate) suspension does Figure 6 refer to?
- (2) When modifying titanium dioxide with polyaniline, was any procedure reported in the literature for the preparation of polyaniline used? The oxidation of *ca* 3 mmol of aniline with 7.5 mmol of peroxydisulfate in neutral medium (*cf.* page 3781 of paper III) is not very typical. Polyaniline is prepared, as a rule, in acidic medium and at much lower peroxydisulfate/aniline molar ratio, 1.25 or lower.
- (3) The polyaniline coating of titanium oxide has a thickness of *ca* 4–5 nm (Figure 1d in Paper III). Aniline molecule has a size of *ca* 0.5 nm. The length of polyaniline chains should certainly be longer than 10 nm. Does that mean that the polyaniline chains grow in parallel with the axis of titanium oxide nanotube?

Mr. Cheng proved, in my opinion, that he is able to carry out the research in the specified direction, to evaluate the results in a qualified manner, to reach corresponding conclusions, and to present them at international level. I recommend, therefore, that **the PhD degree is awarded to the candidate on the basis of the submitted Thesis.**

Dr. Jaroslav Stejskal
26 May 2008