

Supervisor's opinion on the PhD. thesis  
"Preparation and characterization of functional fillers with photocatalytic activity"

by

Milan Masař

submitted to the

Tomas Bata University in Zlin


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Ing. Milan Masař studied in the Study course 'Technology of Macromolecular Compounds' in the Ph.D. programme 'Chemistry and materials technology' at the Centre of Polymer Systems, Tomas Bata University in Zlín, Czech Republic. Within his studies, he has fulfilled all duties connected with the study programme and successfully passed the state examination in 2019. His dissertation work was focused on the preparation and study of UV and especially visible-light active photocatalysts. He synthesised various types of ZnO photocatalysts and characterised them using methods of structural analysis, microscopy, and electron spectroscopies. He evaluated photocatalytic performance of prepared materials by standard means as well as he made some improvements of the measurement apparatuses. Later, he doped these prepared photocatalysts by native oxygen vacancies to shift the effectivity of the photocatalytic reaction to the visible light region. In the third part of the dissertation, he examined decoration of ZnO photocatalysts by silver nanoparticles and demonstrated this approach to be an effective way of increasing the overall efficiency of the photocatalytic process. Lastly, macromolecular photocatalyst (graphitic carbon nitride) was synthesised, and its photocatalytic activity was studied. These newly developed materials are intended for surface functionalization of polymer and composite articles with strong potential in both in-door and out-door large-area applications, e.g., in building façade constructions, for cleaner cities and better living through material innovation in civil engineering.

Milan is a useful member of our group. His work is essential for other members of our team who will continue in use of his materials as starting materials for research on the aforementioned polymer surface modifications. Two projects have been submitted this year to obtain financial support for research on these topics. He also contributed the team with excellent performance in electron microscopy. The abilities and readiness of Milan Masař to start an independent career of a researcher are documented by the list of his publications and presentations on international conferences with full-text contributions in proceedings too. He has experience from many research projects. During his study and work at the TBU in Zlin, Ing. Milan Masař has already demonstrated sufficient diligence, knowledge and effort necessary for successful accomplishment of doctoral study in the PhD. Programme.

Concerning these facts and according to my opinion, I recommend the Thesis for defence and upon successful presentation of his dissertation, and all further necessary considerations by the committee, to award Mr Masař the degree Doctor of Philosophy (Ph.D.).

Zlín 17<sup>th</sup> October 2019



Assoc. Prof. Ing. et Ing. Ivo Kuřitka, Ph.D. et Ph.D.  
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