

**Annotations of Doctoral Thesis Topics for Degree Course in  
„Nanotechnology and Advanced Materials“  
for the Academic Year 2017/2018**

**Topic:** Preparation and characterization of functional nanostructured fillers for advanced polymer systems

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**Annotation:**

The work will be focused namely on preparation and characterization of nanostructured microparticles with special attention paid to mechanisms playing role in the synthesis process. Next, the polymer matrix component will be studied either from the processing point of view or chemical modification of the polymer of natural or synthetic origin. With respect to application, possibilities and processes of nano and micro-materials incorporation into the polymer matrix will be investigated to address recent issues in this field.

**Requirements:**

Knowledge of general, macromolecular chemistry and physics at the university level. Good knowledge of the English language or a potential to the improvement. Basic manual and laboratory work skills. Ability to work independently.

**Literature:**

1. MACHOVSKÝ, M., KUŘITKA, I., BAŽANT, P., VESELÁ, D., SÁHA, P. Antibacterial performance of ZnO-based fillers with mesoscale structured morphology in model medical PVC composites. *Materials Science and Engineering C*, 2014, roč. 41, s. 70-77. ISSN 0928-4931.
2. BAŽANT, P., MÜNSTER, L., MACHOVSKÝ, M., SEDLÁK, J., PASTOREK, M., KOŽÁKOVÁ, Z., KUŘITKA, I. Wood flour modified by hierarchical Ag/ZnO as potential filler for wood-plastic composites with enhanced surface antibacterial performance. *Industrial Crops and Products*, 2014, roč. 62, s. 179-187. ISSN 0926-6690.
3. BAŽANT, P., KUŘITKA, I., HUDEČEK, O., MACHOVSKÝ, M., MRLÍK, M., SEDLÁČEK, T. Microwave-assisted synthesis of Ag/ZnO hybrid filler, preparation, and characterization of antibacterial poly(vinyl chloride) composites made from the same. *Polymer Composites*, 2014, roč. 35, č. 1, s. 19-26. ISSN 0272-8397.
4. OZIN, G.A., CADEMARTIRI, L. *Nanochemistry: a chemical approach to nanomaterials*. Cambridge : RSC Publishing, 2009