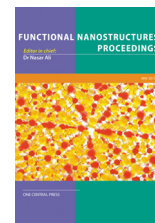


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TiO₂/Cu_xO heterostructures for photocatalysis

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ABSTRACT

TiO₂/Cu_xO can be an example of heterojunction photocatalyst with enhanced activity due to extended light absorption, effective separation of photogenerated carriers, improved reactant adsorption and activation in charge consumption [1,2]. Properties of TiO₂ nanocrystals can be optimized by tuning morphology, which includes modifications of the size, shape, composition and also facets engineering [3].

The aim of this work was to study microstructural, structural and optical properties of unmodified and modified TiO₂ nanocrystals with the use of copper oxides. TiO₂ nanocrystals with different shapes were synthesized during hydrothermal reaction [3]. Preparing of TiO₂/Cu_xO composites consisted of modified sol-gel method, namely simultaneous synthesis of copper oxide and deposition on the TiO₂ nanocrystals. Materials were characterized with the use of X-ray diffraction (XRD), Scanning Electron Microscopy (SEM), Transmission Electron Microscopy (TEM), UV-vis spectrophotometry. TiO₂/Cu_xO system for photocatalytic decomposition of organic dyes were applied.

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II. REFERENCES

- [1] L. Liu, W. Yang, W. Sun, Q. Li, and J. K. Shang, *ACS Appl. Mater. Interfaces.*, 7, 1465 (2015).
- [2] S. Bai, Lili Wang, Z. Li, and Y. Xiong, *Adv. Sci.*, 4(1), 1600216 (2016).
- [3] A. Kusior, J. Banas, A. Trenczek-Zajac, P. Zubrzycka, A. Micek-Ilnicka, M. Radecka *J. Mol. Struct.*, 1157, 327 (2018).