

SYNTHESIS AND CHARACTERIZATION OF Pt-CoO JANUS NANOSTRUCTURES**Dániel S. Berkesi^{1,2}, Roland Bálint¹, András Sági¹, Ákos Kukovecz^{1,2}, Zoltán Kónya^{1,3}**¹*University of Szeged, Department of Applied and Environmental Chemistry, Szeged, H-6720 Szeged, Dóm tér 7, Hungary*²*MTA-SZTE “Lendület” Porous Nanocomposites Research Group, Szeged*³*MTA-SZTE Reaction Kinetics and Surface Chemistry Research Group, Szeged**email: sapia@chem.u-szeged.hu***Abstract**

Janus nanoparticles, nano-sized particles with two regions of different surface and different chemical composition, possess energetic interactions that depend not only on their separation but also on their orientation. Since it is known that the metal-metal oxide interfaces take important part in catalytical reactions[1], we are focusing our researches to this field.

Various Pt-CoO nanostructures were synthesized using Pt seeds made with polyol[2] method. Not only Janus nanoparticles but other nano-sized structures were synthesized. During the experiments an universal experimental system was built and used to produce monodisperse noble metal nanoparticles in different sizes. The results were investigated with X-ray Diffractometry and with Transmission Electron Microscopy. The future aims are to use these particles as a supported catalyst on solid-liquid and solid-gas phase interfaces, and determine the turnover rates and selectivity based on the experiments in different catalytic reactions.

References

- [1] Yusuke Yamada, Chia-Kuang Tsung, Wenyu Huang, Ziyang Huo, Susan E. Habas, Tetsuro Soejima, Cesar E Aliaga, Gabor A. Somorjai, Peidong Yang: Nanocrystal Bilayer for Tandem Catalysis, *Nature Chemistry* 3, 372–376 (2011)
- [2] Hailiang Wang, Andras Sapi, Christopher M. Thompson, Fudong Liu, Danylo Zherebetsky, James M. Krier, Lindsay M. Carl, Xiaojun Cai, Lin-Wang Wang, Gabor A. Somorjai: Dramatically Different Kinetics and Mechanism at Solid/Liquid and Solid/Gas Interfaces for Catalytic Isopropanol Oxidation over Size-Controlled Platinum Nanoparticles *J. Am. Chem. Soc.*, 2014, 136 (29), Pp 10515–10520