

**TUNABLE HIERARCHICAL POROUS POLYMERS WITH SUPPORTED
CONTROLLED SIZE NANOPARTICLES IN HETEROGENEOUS CATALYTIC
REACTIONS**

**Viktória Rácz¹, Juan Gómez-Pérez¹, Gábor Varga^{1,2}, Fanni Czirik¹, Zita Sándor¹,
András Sági^{1*}, Eszter Szentpéteri¹, Ákos Kukovecz¹, Zoltán Kónya¹**

¹ *Department of Applied and Environmental Chemistry, University of Szeged, Rerrich Béla tér 1, H-6720 Szeged, Hungary*

² *Department of Organic Chemistry, University of Szeged, Dóm tér 8, H-6720 Szeged, Hungary*

³ *MTA-SZTE Reaction Kinetics and Surface Chemistry Research Group, Rerrich Béla tér 1, H-6720 Szeged, Hungary*

* *Corresponding author: sapia@chem.u-szeged.hu*

Abstract

Hierarchically porous polymers (HPPs) with different meso- and microstructures were decorated with controlled size platinum nanoparticles in the range of 1-12 nm. In this project, we have tested the HPPs+Pt composites as novel catalysts in the gas and liquid phase for CO oxidation and Suzuki coupling reactions, respectively. In the Suzuki coupling reactions, the catalysts made of HPP and Pt nanoparticles have shown better catalytic performance and recyclability in different solvents, in comparison with SBA+Pt catalysts. Furthermore, the samples were examined by different characterization methods such as Raman spectroscopy, SAXS, BET, TEM, TGA, ICP-MS to identify their surface properties, thermal stability, and the accurate percentage of Pt nanoparticles in the composites. Our results revealed that the tuning of the HPP pore structure is the key for high activity and selectivity reactions.

Keywords: HPP, Pt nanoparticles, CO oxidation, Suzuki coupling reaction