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Nanocatalysis and continuous-flow processing: Towards greener and more sustainable chemistry

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Colloidal Nanocrystals (NCs) are solution-grown, nanometer-sized, inorganic particles that are stabilized by a Self-Assembled Monolayer (SAM) of surfactants attached to their surface. NCs possess useful properties that are controlled by their composition, size and shape, and the SAM coating ensures that these structures are easy to fabricate and process further into more complex structures. This combination of features makes colloidal NCs attractive and promising building blocks for advanced materials, green chemistry, and specifically in catalysis. Colloidal NCs are potentially able to blend the many advantages of heterogeneous catalysis with the versatility of homogeneous catalysts. This presentation will focus on: (i) Advantages of continuous-flow processing in *in-situ* preparation of Fe_3O_4 NCs from a Fe (e.g., $FeCl_2{\cdot}4H_2O$, $FeCl_3{\cdot}6H_2O$, and $Fe(OAc)_2$) precursor using hydrazine hydrate as the reducing agent to catalyze the organic reactions (e.g., reduction of nitroarenes) and (ii) Shape-selective synthesis of TiO_2 colloidal NCs and their application in a continuous-flow photocatalytic transformation.

Biography

Mostafa Baghbanzadeh completed his PhD in Organic Chemistry at Shahid Beheshti University of Tehran. Then, he joined Kappe's lab at the University of Graz, serving as a Group Leader for studies on synthesis and application of nanocrystals using microwave and continuous-flow technologies. Since 2013, he has been a Postdoctoral Fellow in the Whitesides lab at Harvard University. He has published 53 publications in per-reviewed journals which are cited more than 2000 times, and his h-index is 25. His research interests are orgainc synthesis, catalysis, nanomaterials, green and sustainable chemistry, organic electronics, and reaction networks.

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