Extended Abstract

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The development of spheres-on-sphere silica particles for fast and efficient HPLC separation

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Core-shell silica particles have been developed and employed by various manufacturers for fast and efficient HPLC separations with relatively low back pressure. However, core-shell silica particles are usually fabricated by the time-consuming layer-by-layer technique and usually followed by a lengthy classification process to obtain uniform particles. Recently, we have developed a onepot synthesis method at room temperature to produce the unique spheres-on-sphere (SOS) silica particles. These SOS particles are comprised of silica nanospheres attached to silica microspheres. The size and number of silica nanospheres are tunable. The interstices between the surface silica nanospheres on the solid microspheres generate the macroporosity for fast and efficient HPLC separations with low back pressure, particularly for large bio-macromolecules. Importantly, these SOS particles are very uniform directly from synthesis (hence classification in unnecessary) and mesoporosity and additional functional particles may be introduced so that these particles can be efficiently used for fast separation of a wide range of analytes, including peptides, proteins, small molecules, and isomers. This talk will cover the preparation and characterization of SOS particles and their various applications in HPLC.

Biography:

Haifei Zhang is a Senior Lecturer in the Department of Chemistry at University of Liverpool. He has completed his undergraduate and Master degrees in Chemical Engineering and PhD in Physical Chemistry from Chinese Academy of Science. He has published 90 peer reviewed research papers with h-index of 29 and filed 9 international patents as a Co-inventor. He won the 12th Desty Memorial Award in 2007 for his innovative work in the manufacture of porous materials and their possible application in chromatography. He has also written five book chapters and one book (to be published by Wiley in 2018). His main research interests are on porous materials, colloids, carbon materials, and nanostructured materials for separation and energy storage applications.