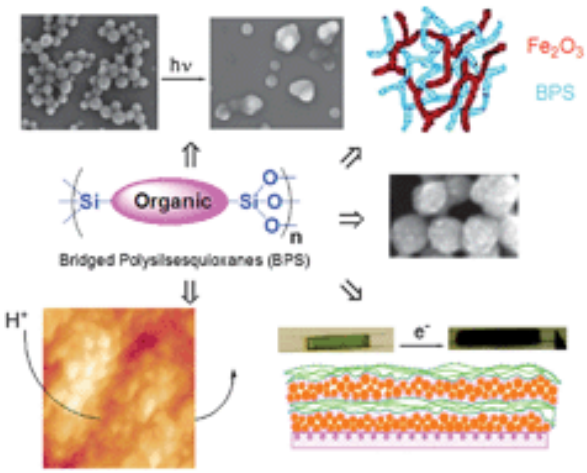
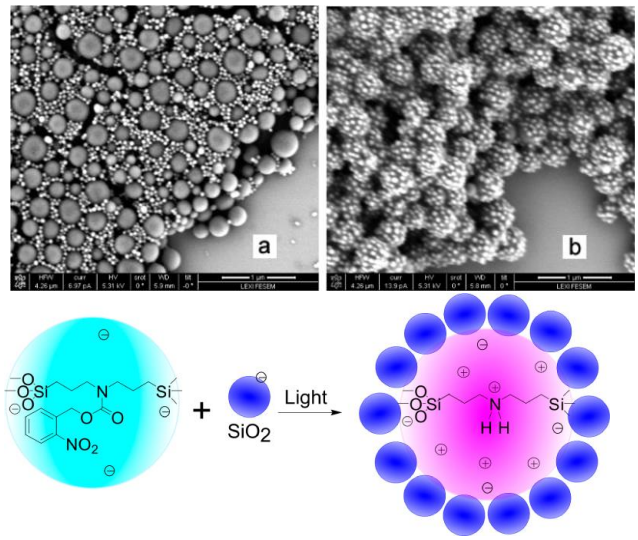
“Organo-Silica Hybrid Functional Nanomaterials: How do Organic Bridging Groups and Silsesquioxane Moieties Work Hand-in-hand?”, Li-Chih Hu, Kenneth J. Shea, *Chemical Society Reviews*. **2011**, *40*, 688-695.



Bridged polysilsesquioxanes (BPS) are a class of versatile functional hybrid materials with tunable chemical, physical and mechanical properties. This *tutorial review* describes recent advances of these functional hybrid nanomaterials. The review includes control of factors affecting nanometre scale morphology, the preparation of spherical hybrid nanoparticles, along with applications in fields including energy, optics and electronics. Special emphasis will be made regarding the synergy between the organic component of the hybrid material and the polysilsesquioxane moieties.

“Light-triggered Charge Reversal of Organic-Silica Hybrid Nanoparticles” Li-Chih Hu, Yusuke Yonamine, Shih-Hui Lee, Wytze E. van der Veer, Kenneth J. Shea, *Journal of the American Chemical Society*, **2012**, *134*, 11072 - 11075.



A functional nanoparticle with light-triggered charge reversal based on a protected amine-bridged polysilsesquioxane was designed. An emulsion- and amine-free sol–gel synthesis was developed to prepare uniform nanospheres. Photolysis of suspensions of these nanoparticles results in a reversal of the ζ potential. This behavior has been used to trigger nanoparticle self-assembly, nanocomposite hydrogel formation, and nanoparticle release, showing the potential of this material in nanoscale manipulation and nanoparticle therapy.