

The Structure-Function Relationship and Applications of Noble Metal Nanomaterials

Nanoparticles of silver and gold have been studied for decades and used as the basis for countless materials. From catalysis to chemical sensing, important applications rely on the continued development and understanding of these unique and powerful materials. Nanomaterials owe their utility and precise function to their size, shape and support or in other words, their structure. In order to continue to push nanomaterials forward and realize new and improved applications, we must develop materials that can address issues of long-term stability without sacrificing the important electronic and optical properties of nanoparticles. Improving our understanding of the interplay between structure and function will help these already widely used materials achieve their true utility. To accomplish these goals, silver and gold nanomaterials with tailored size, shape and support were synthesized and showcased as promising redox catalysts, chemical sensing platforms, hydrovoltaic power generators and more.