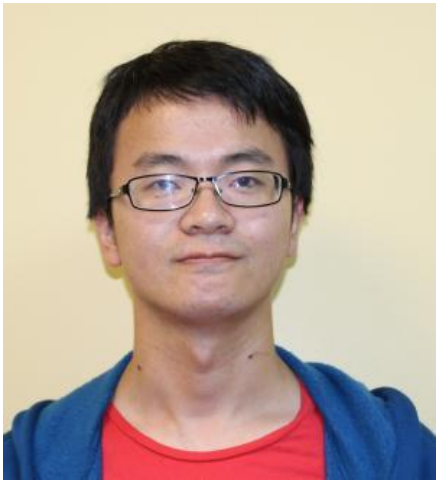
Department of Chemistry Seminar Series

Spring 2023

Monday, March 27, 2023, 3:30 PM – HPA1-O119 (Health Sciences)

Understanding the Impact of Wall Thickness on Thermal Stability of Silver-Gold Nanocages



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The thermal stability of nanocages is of great research value in both fundamental studies and practical applications. In our research work, by focusing on silver−gold (Ag−Au) alloyed nanocages as a model system, we demonstrate that the wall thickness of the nanocage is a critical parameter in determining its thermal stability. We systematically evaluated the thermal stabilities of Ag−Au nanocages with different wall thicknesses in the range 3.8−13 nm in both solution and solid phases. The results showed that, in both phases, nanocages with thicker walls displayed better stabilities. At sufficiently high temperatures, the nanocages were deformed to thermodynamically more stable nanostructures. The deformation processes were found to be different for nanocages with various wall thicknesses, which were carefully monitored and analyzed by electron microscopy imaging. Changes in plasmonic properties of the nanocages during heat-induced deformation processes were also investigated.