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Properties of bimetallic core-shell nanoclusters
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Abstract
Gold (Au) and copper (Cu) materials and their combination exhibit the most of the main wanted properties in nanostructures. Nobel metals such as Au and Cu have important magnetic, electronic, optical, catalytic and thermal properties. Compared to monometallic clusters, bimetallic nanoclusters have more degrees of freedom and distinct properties due to the presence of two different metals. It is also well known that the shape, surface topography, segregation, mixing, ordering, energetic stability, and electronic structures of bimetallic nanoclusters may depend significantly on their composition. This affords greater opportunity to control their properties by modifying composition as well as size. In this work, we investigated magnetic and electronic properties for AuCu bimetallic core-shell structures and showed that the CuAu coreshell can have a half-metal property through chemical composition modification. Half-metallic ferromagnets attract increasing research interest as potential materials for spintronic device applications. Copyright © 2012 by ASME.

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