

The morphology and growth kinetics of silicon-silver multicomponent heterostructured nanoparticles in the gas phase

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The morphology and growth kinetics of silicon-silver (Si-Ag) multicomponent heterostructured nanoparticles in the gas phase were investigated. This system is interesting because Si is photoluminescent while Ag is plasmonic and, most importantly, because Si and Ag are eutectic-forming materials immiscible in the solid state. Remarkably, molecular dynamics (MD) simulations supported by high-resolution bright field (BF) transmission electron microscopy (HRTEM) and aberration-corrected scanning transmission electron microscopy (STEM) with a resolution <0.1 nm in high angle annular dark field (HAADF) mode, revealed that the growth kinetics of such a system can be more complicated than just attaching Ag to Si and involve intermediate metastable phase transformations.

Biography

Mukhles Sowwan is the Director of the nanoparticles by design unit at Okinawa Institute of Science and Technology (OIST)-Japan and a visiting Professor at SLAC national laboratory-CA-USA. His research is focused on the design and fabrication of multifunctional-multicomponent nanoparticles for nanotechnology and bio-medical applications.

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