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

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Abstract

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.

References:

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Biography:

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.