

Generation of bimetallic Janus particles using colloidal lithography

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Anisotropic or amphiphilic particles rarely prepared with typical synthesis methods have been proved to be useful for flexible display, controlling molecular recognition and self-assembling processes. The combination of unique physical and chemical properties with anisotropic particles provides new opportunities of novel material properties in the regime of nanometer scales. Here, we propose a novel synthesis method of bimetallic Janus particles from polystyrene nanopillars capped with silica particles created via reactive ion etching through the colloids self-assembled over the polystyrene film. A variety of kinds of metal such as gold, palladium and nickel were coated on both sides of particles. Other kinds of metal are also applicable if they can be coated through unisotropic coating instrument such as magnetron sputter or e-beam evaporator. UV-VIS-NIR absorption spectra of our Janus particles dispersed in water shows the wide range of absorption in the regime of infrared useful for the low damage biomolecular detection.