Preparation and chracterization of Janus silica particles using PS particle barrier

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In nanoparticle-based field, the chemical composition of surface have effects on the properties of particles and the performances of applications. The surface modification is the one of the control methods onto the properties of nanoparticles.

In this research, Janus silica particles were prepared by using monolayer of PS (polystyrene) particles as barrier. PS particles were arrayed by spin coating of PS suspension on the silicon wafer, and silica suspension was dropped and coated on the PS particle layer. After heating the silica/PS/wafer sample at 200 °C for 20 min, the barrier was formed with some part of silica particles buried. The introduction of silane compounds on the unblocked surface of the silica particles were performed in DI water, ethanol, and ammonium hydroxide mixture solution at 40 °C for 12 hr. During the reaction, the modifying compounds were added to the solution using micro feed pump. After the reaction, PS barrier was removed and the Janus silica particles were gained. The silica particles were characterized by SEM, ^{13}C solid-state NMR, water contact angle (WCA) measurements.