Electronic Supplementary Material (ESI) for Physical Chemistry Chemical Physics.

Supplementary Information

Investigation of plasmon resonance in metal/ dielectric nanocavities for high-efficiency photocatalytic device

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Nanoparticle Analysis:

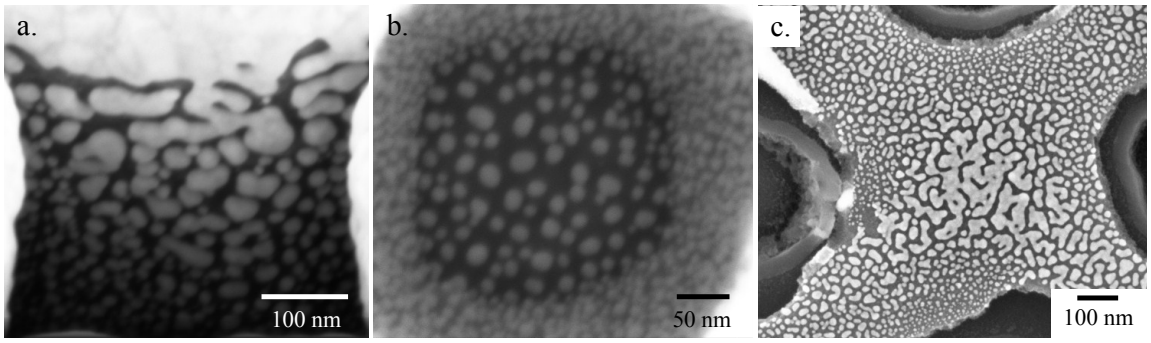

Figure 1S: SEM images showing the Au nanoparticles formed at different locations of the devices.

(a) Outside view of a sidewall from a tilt angle of 38°. Filling fraction: ca. 45 %, 200-300 nm from top edge is seen as continuous Au material. Average particle diameter varies from 20 nm to 5 nm (from top to bottom). Average neighboring distance (edge to edge) is ca. 9 nm.

(b) Au nanoparticle formed at the bottom surface inside the cylindrical cup like structure (top view). Filling fraction: 34.6 % with average particle diameter: 15.3 nm and average neighboring distance (edge to edge): 6.0 nm.

(c) The image (top view), showing the region in between the MSPhC structures (taken after carefully removing few MSPhC structures using an Omniprobe).

Bulk Crystalline Information from WS sample:

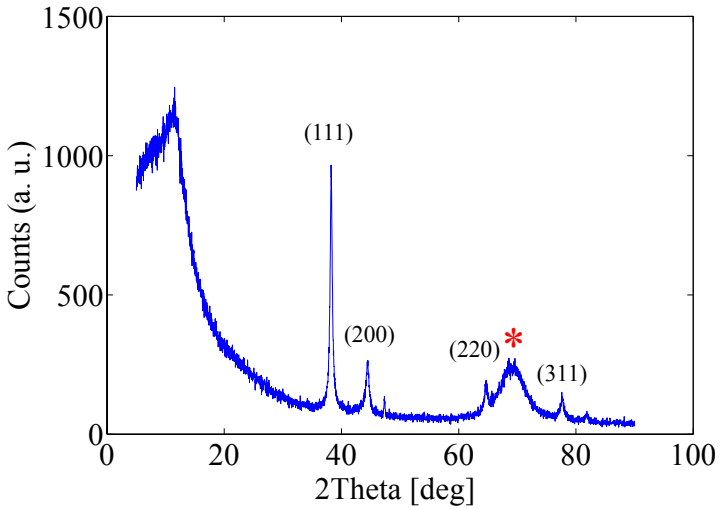

Figure 2S: XRD data from a WS sample shows different crystalline planes of Au. XRD pattern suggests the formation of crystalline Au with face-centered cubic (fcc) structure.

*A suppressed peak appears due to Si substrate

Relative thickness of the WS lamella:

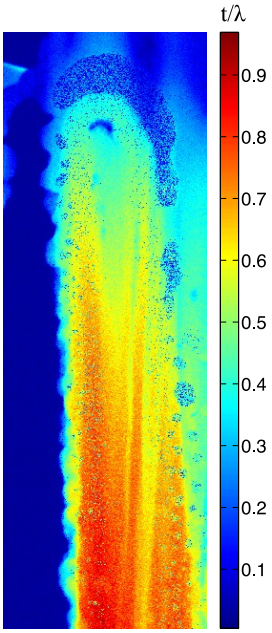

Figure 3S: Relative thickness (t/λ) calculated from the EELS spectrum image. The uniform color across the Au region indicates the thickness of the Au region to have a uniform thickness. The Au region (FH) has t/lambda of around 0.2.