

Supporting Information

Additional TEM images of as synthesized Rh nanocubes and tripod nanoparticles Figure S1.

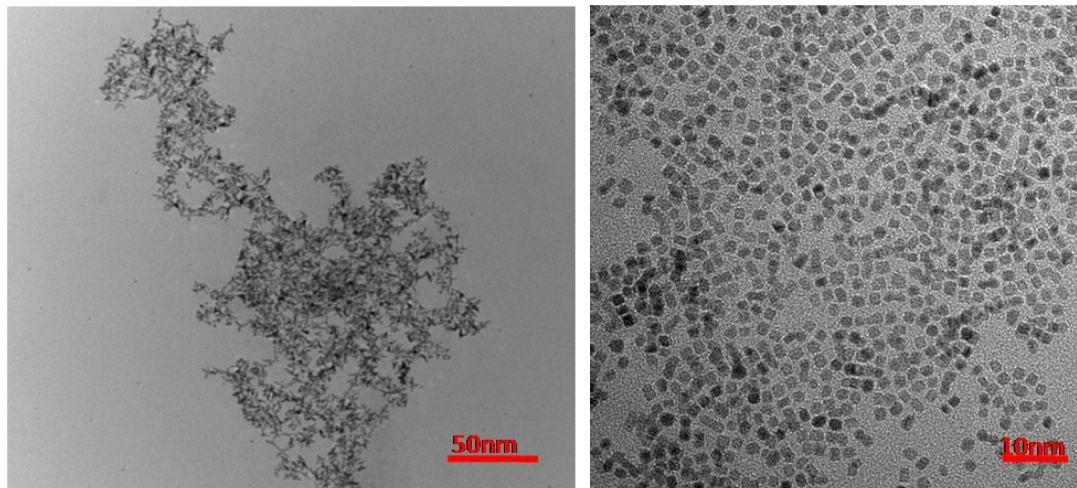


Figure S1: TEM images of as-synthesized Rh nanocubes and tripod under nitrogen environment

Figure S2 represents the absorption spectra of Rh nanocube and tripod nanoparticles deposited on APTMS treated substrate obtained after cleaning and drying the sample with nitrogen.

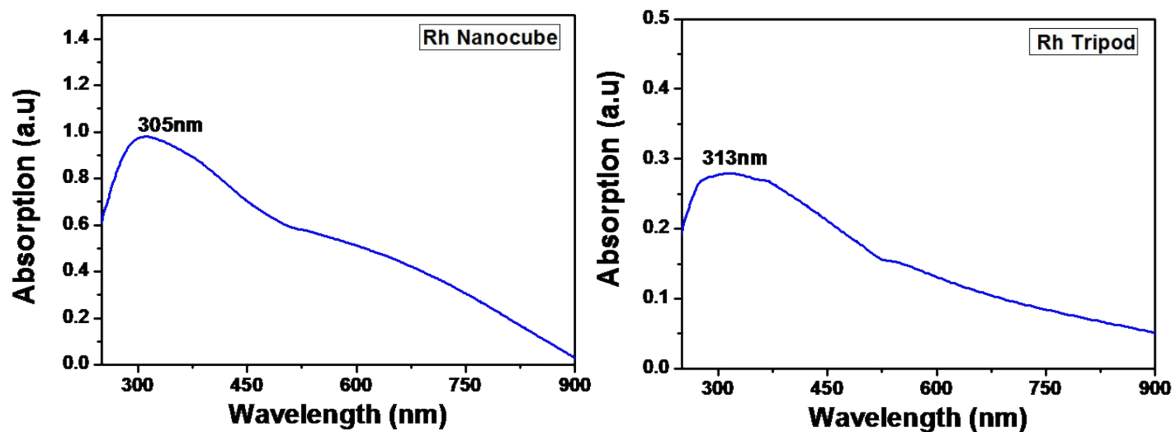


Figure S2 : Absorption spectra of Rh (a) nanocube and (b) tripod nanoparticles self-assembled on APTMS treated substrate.

Figure S3 represents the typical original Raman spectra obtained under 266nm, 325nm and 532nm without any background or baseline corrections.

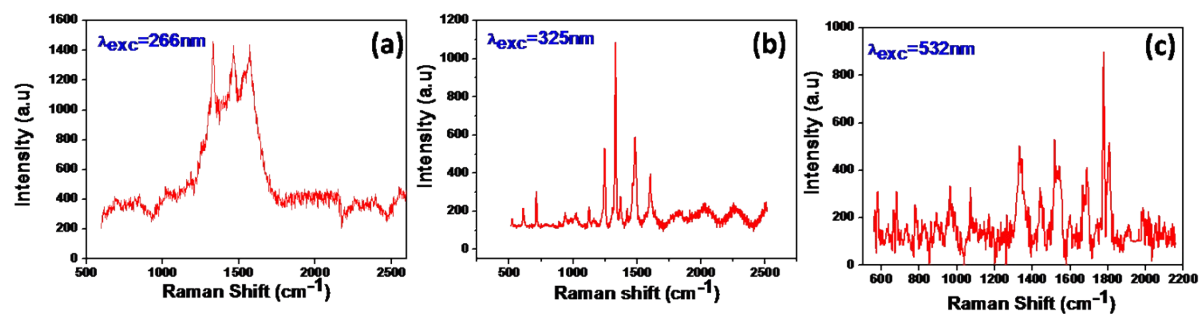


Figure S3: The original SERS spectra obtained under Raman excitation wavelength 266nm, 325nm and 532nm respectively.

The SERS spectra obtained post O₂-plasma treatment for different cycle is shown in Figure S4.

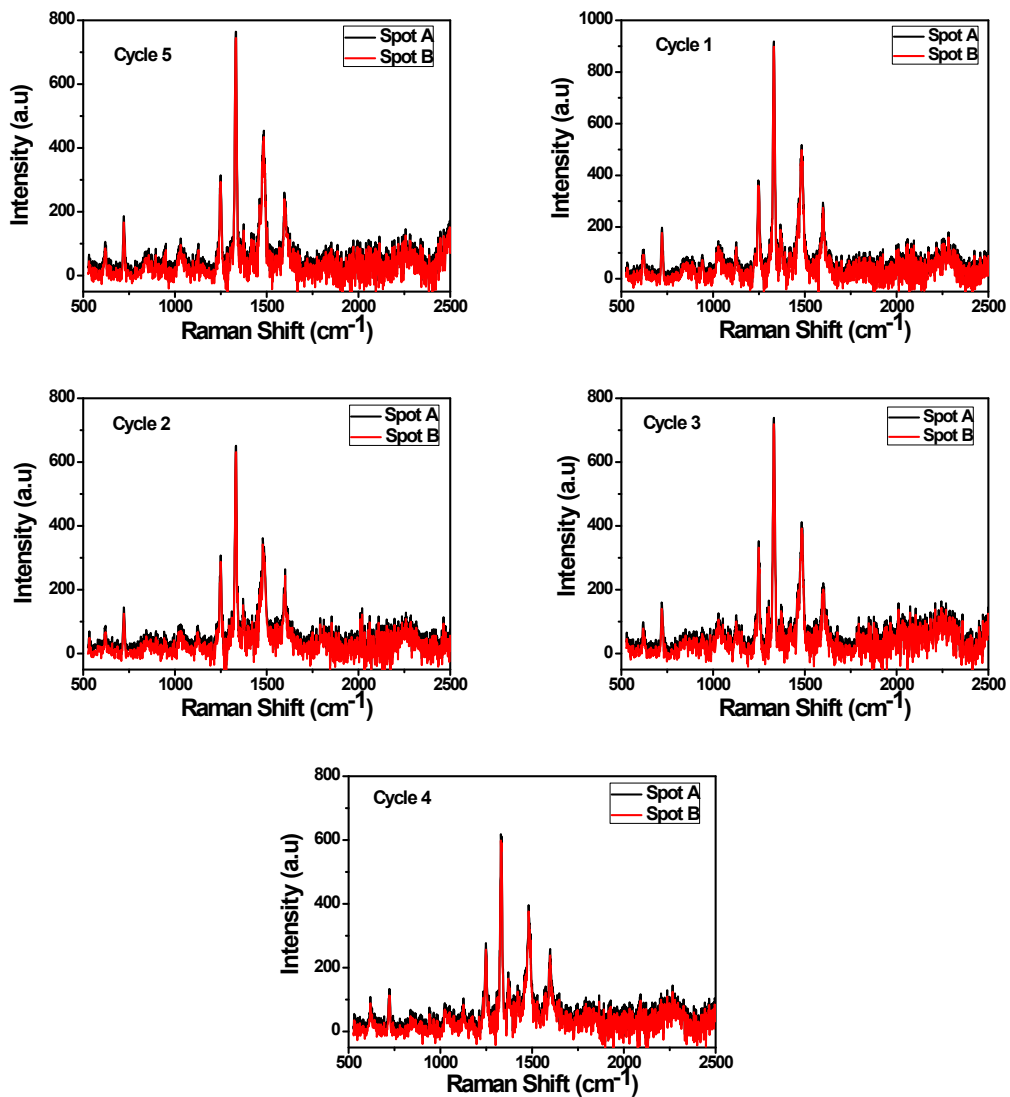


Figure S4: The SERS spectra obtained post O₂-plasma treatment for different cycle is displayed below and also included in the supporting information.

Figure S5 represents the fitted material data index correlating background index of ethanol.

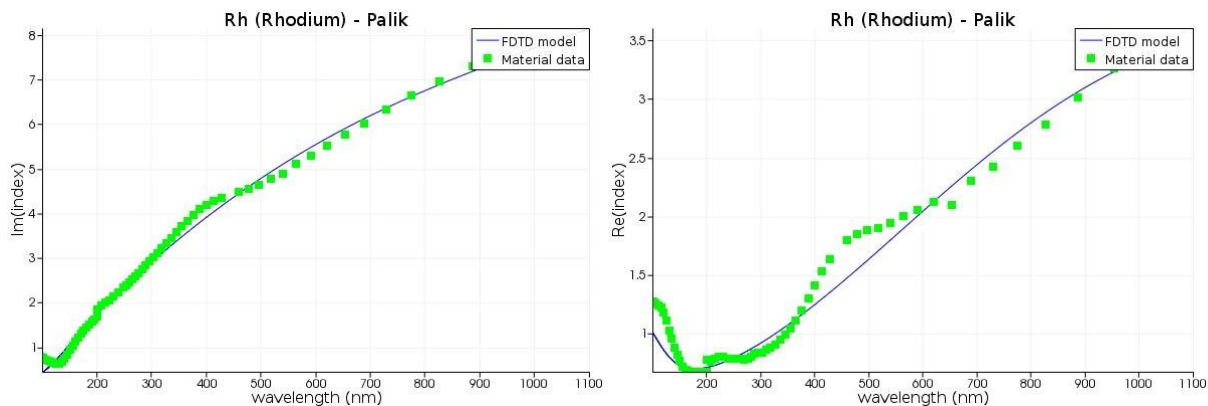


Figure S5: The experimentally calculated real and imaginary part of index of rhodium from Palik's model and the corresponding FDTD model fit.

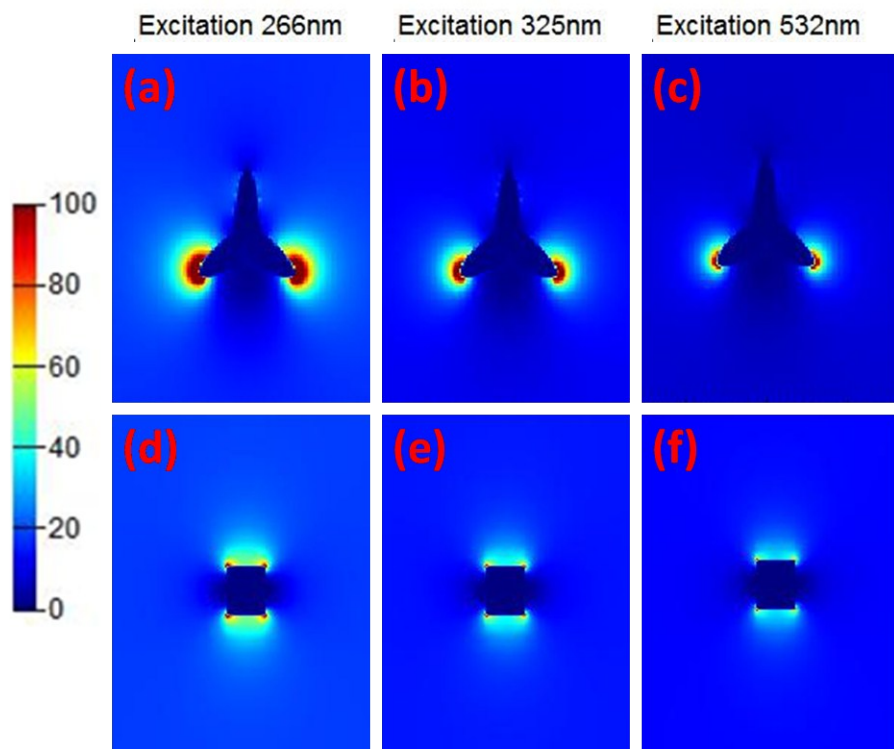


Figure S6: Electric field $|E|^2$ distribution plot of (a)-(c) Rh tripod NP and (d)-(f) Rh nanocube geometry illuminated under normal incidence with fixed linear polarization along a different plane for 266nm, 325nm and 532nm excitation wavelengths.