

Enhanced Refractive Index Sensing with Monodisperse Faceted Plasmonic Nanoparticles

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The shape-dependent optical properties of metal nanostructures have motivated efforts to correlate nanoparticle structure with plasmonic behavior. In particular, gold bipyramids (BPs) are of interest due to their sharp tips that lead to strong localized field enhancement and high sensitivity to the surrounding environment. However, despite their potential, relatively few reports have studied the optical properties of sub-100 nm BPs due to their relatively low synthetic yields. To overcome this issue, density gradient centrifugation has been used to isolate the minority BPs from the rhombic dodecahedra (RD) that are predominant following synthesis. The resulting monodisperse BPs show 2.5 times higher refractive index sensitivity than RD nanoparticles.

