Au-MOF nanohybrids as templates for fabrication of pH-sensing nanoprobes

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Zeolitic imidazolate framework-8 (ZIF-8) is a metal organic framework with exceptional intrinsic properties, high tunability, cost-effective and producible, which has boosted the research development of the field. ZIF-8-based materials have shown high capabilities for multiple purposes as catalysts, capacitors, electrodes, drug delivery systems or adsorption/separation membranes. On the other hand, plasmonic nanoparticles made of Au and/or Ag exhibit unique and tuneable optical properties in the visible-NIR range that have been extendedly exploited in a wide range of applications. Herein, we report the synergistic combination of ZIF-8 and plasmonic nanoparticles for fabricating novel plasmonic nanostructures with enhanced properties for sensing and bioimaging. The nanostructures consist of a single plasmonic nanoparticle encapsulated within a ZIF-8 framework induced by the presence of on the nanoparticles surface. The CTAB also plays an important role in the modulation of the ZIF-8 thickness. [1, 2] The optical properties of the core-shell hybrid can be easily modulated by changing the size, morphology and composition of the plasmonic core [1, 2]. Finally, we demonstrate the applicability of this plasmonic hybrids for sensing and bioimaging based on Surface-enhanced Raman scattering (SERS) [3] as well as to fabricate plasmonic porous nanocapsules for in situ monitoring pH changes in a colony of *E. coli.*

References

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