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Encapsulation and Functionalization of Nanoparticles in Crosslinked Resorcinarene Shells
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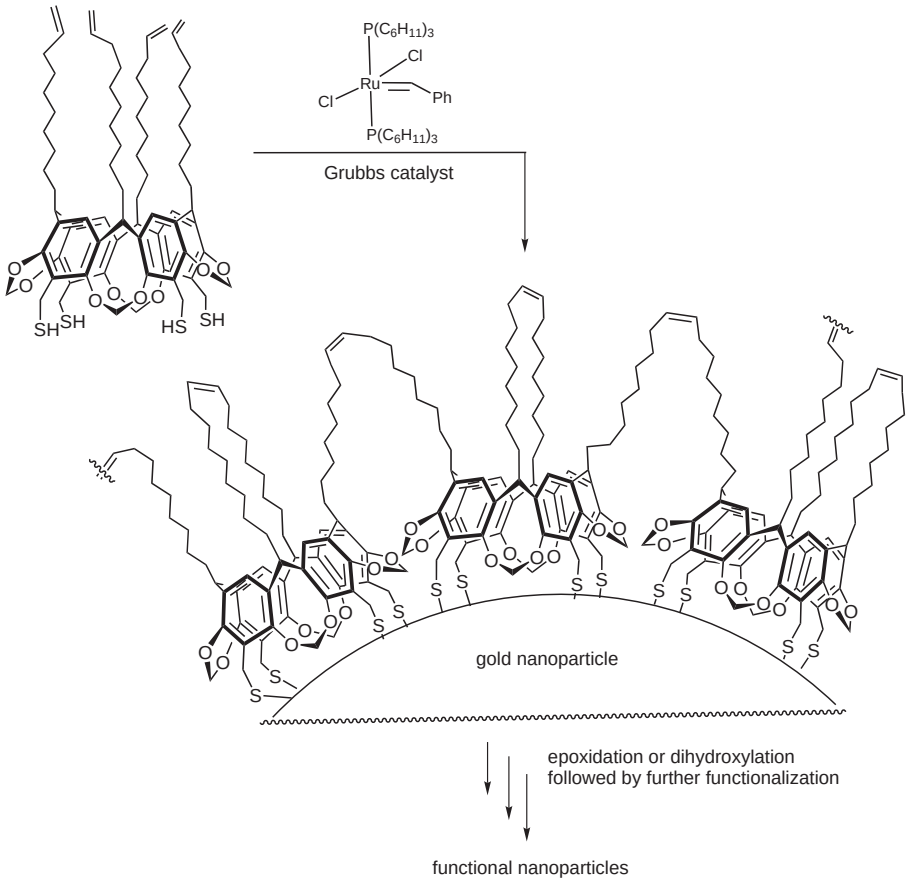
Robust Nanocoatings for Nanoparticles



Significance: Methods to create stable functionalized nanoparticles are needed for applications of these materials. The rigid tetrathio-resorcinarene scaffold creates a strong interaction with gold nanoparticles and subsequent acyclic diene metathesis polymerization by the first-generation Grubbs catalyst gives well-behaved materials that can be precipitated and redispersed multiple times. These crosslinked nanocoatings can be subjected to oxidation reactions that provide access to a diverse array of functionality.

Comment: Gold nanoparticles have found many applications in biosensing and nanophotonics. However, the utility of larger gold nanoparticles (>10 nm) is generally limited by instabilities in their coatings and a tendency to aggregate. This research provides one of the best examples of a designed coating for nanoparticles that is robust and functionalizable. Larger nanoparticles are stabilized and functionalization of the nanocoatings allows for the solubility to be modified and for bioconjugation.

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Category

Synthesis of Materials and Unnatural Products

Key words

nanoparticles

calixarenes

monolayers