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Graphene Oxide Interface Enhances the Photochemical Synthesis, Stability and Photothermal Effect of Plasmonic Gold Nanostructures

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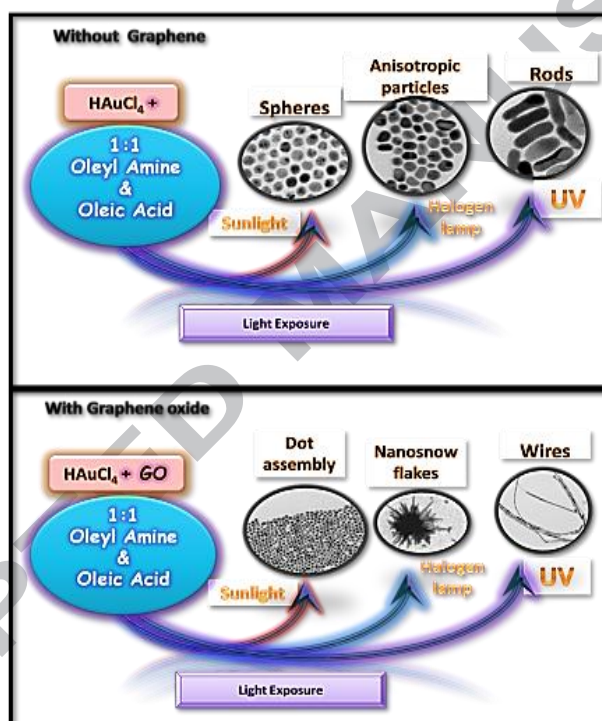
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Abstract

A novel photochemical approach is presented for the synthesis of shape-controlled plasmonic gold nanostructures supported on reduced graphene oxide. Graphene oxide (GO) interface enhances the rate of photochemical reduction of gold ions in water and influences the growth rate of the initial gold nuclei leading to the formation of different shapes and assemblies depending on the light source. The size, shape and morphology of the Au nanocrystals could be tailored by varying the light source and the exposure time. The resulting hybrid Au@RGO plasmonic nanostructures show significantly enhanced photostability and photothermal response as compared to free gold nanostructures.

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