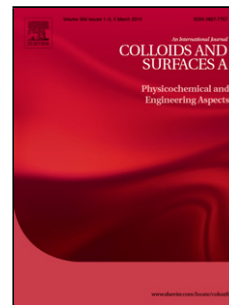


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Synthesis of gold and silver nanoparticles functionalized with organic dithiols

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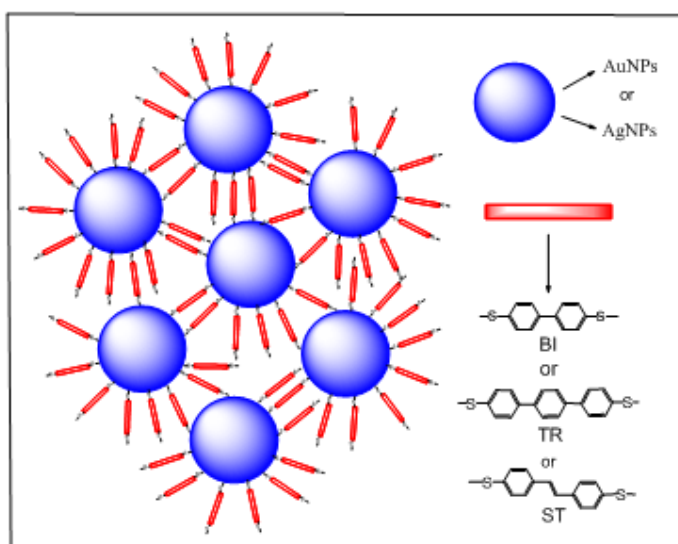
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Graphical Abstract



<InlineImage1>

Abstract

In this work commercially available bifunctional organic dithiols, 4,4'-dithiol-biphenyl (BI), 4,4''-dithiolterphenyl (TR) and the on purpose prepared precursor of 4,4'-dithiol-*trans*-stilbene (ST), have been used for the stabilization of gold and silver nanoparticles (AuNPs and AgNPs). The bifunctional thiols have been chosen with different conjugation length, to prepare interconnected system of nanoparticles in order to achieve a tuning of their optical properties. The obtained AuNPs and AgNPs have been characterized by means of Uv-Vis spectroscopy to investigate the presence and shift of the Surface Plasmon Resonance (SPR); Field Effect Scanning Electron Microscopy (FESEM) allowed to achieve information on the NP's morphology and size. Furthermore, the X-ray Photoelectron spectroscopy (XPS) measurements have been carried out to obtain structural information. AuNPs and AgNPs with mean size in the range 5-20 nm appeared at regular distances in FESEM images and XPS analysis revealed the presence of physisorbed and chemisorbed thiols. In particular AgNPs showed a lower quantity of physisorbed thiol and an higher tendency to form interconnected

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