

Solvent effects on the optical properties of PEG-SH and CTAB capped gold nanorods

Autorzy

Małgorzata Wielgus

Marta Gordel

Marek Samoć

Wojciech Bartkowiak

Rok wydania

2016

Czasopismo

Acta Physica Polonica A

Numer woluminu

130

Strony

1380-1384

DOI

10.12693/aphyspola.130.1380

Kolekcja

Naukowa

Język

Angielski

Typ publikacji

Artykuł

Streszczenie

Cetyltrimethylammonium bromide (CTAB) and (11-mercaptopundecyl)tetra(ethylene glycol) (PEG-SH) capped gold nanorods were prepared and dispersed in water and dimethyl sulfoxide (DMSO). Transmission electron microscopy images reveal that changing the solvent from water to DMSO cause that nanoparticles tend to organize (PEG-SH ligand) or aggregate (CTAB ligand). UV-vis absorbance spectra reveal that ligand as well as solvent exchange cause positive solvatochromic shifts and changes in the relative extinction values. After the transfer of nanorods from a solvent of lower to higher refraction index a red shift of the longitudinal surface plasmon resonance band is observed. This effect is more pronounced in the case of PEG-SH capped nanorods. Time resolved pump-probe measurements revealed that both ligand and solvent exchange influence the excited state relaxation times, however, a more pronounced change is induced by the ligand exchange. Two-photon excited fluorescence spectra of PEG-SH covered nanorods showed a slight intensity increase when moving from water to DMSO solvent. © 2016, Polish Academy of Sciences. All rights reserved.

Adres publiczny

<http://dx.doi.org/10.12693/APhysPolA.130.1380>

Strona internetowa wydawcy

<http://www.ifpan.edu.pl>