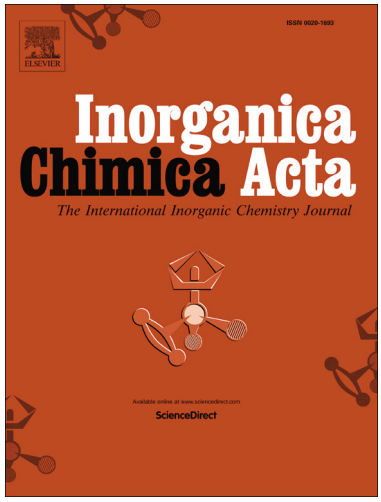

Research paper

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PII: S0020-1693(18)31393-8
DOI: https://doi.org/10.1016/j.ica.2018.10.006
Reference: ICA 18552

To appear in: *Inorganica Chimica Acta*

Received Date: 5 September 2018
Revised Date: 3 October 2018
Accepted Date: 3 October 2018

Please cite this article as: J. Elistratova, B. Faizullin, N. Shamsutdinova, A. Gubaidullin, I. Strelnik, V. Babaev, K. Kholin, I. Nizameev, E. Musina, R. Khairullin, A. Karasik, A. Mustafina, Synthesis of Au(I) complex-based aqueous colloids for sensing of biothiols, *Inorganica Chimica Acta* (2018), doi: https://doi.org/10.1016/j.ica.2018.10.006

Synthesis of Au(I) complex-based aqueous colloids for sensing of biothiols.

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Abstract

The present work represents new facile route for synthesis of luminescent hydrophilic core-shell colloids, where the luminescence results from Au(I) complex $(AuCl)_2L$ with cyclic PNNP ligand (L). The synthesis is based on solvent mediated aggregation of $(AuCl)_2L$ in aqueous organic solutions. Instability of $(AuCl)_2L$ in aqueous organic solutions was minimized by specific hydrophilic shell deposition arisen from electrostatically driven adsorption of polyethylenimine onto $(AuCl)_2L$-based cores. Luminescence of the colloids is stable for week at least due to restricted degradation of the luminescent complex at the interface and high positive exterior charge of the colloids. The sensing properties of the colloids towards thiols results from their complex formation with Au^+ ions. The thiol-induced stripping of Au^+ ions from the colloids quenches the luminescence. The optimal conditions for fluorescent recognition of cysteine, homocysteine and glutathione with lower detection limits about 1μM are highlighted in the work.

Keywords: Sensor Biothiols Luminescence Au(I) complex 1,5,3,7-diazadiphosphacyclooctane

1.Introduction

Heavy-metal complexes with d^{10} electron configuration have gained great attention during recent decades due to their unique photophysical characteristics, which makes them a good alternative to organic molecules in design of