

# Accepted Manuscript

Research paper

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

Julia Elistratova, Bulat Faizullin, Nataliya Shamsutdinova, Aidar Gubaidullin, Igor Strelnik, Vasily Babaev, Kirill Kholin, Irek Nizameev, Elvira Musina, Rafil Khairullin, Andrey Karasik, Asiya Mustafina

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>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

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

Julia Elistratova<sup>a\*</sup>, Bulat Faizullin<sup>b</sup>, Nataliya Shamsutdinova<sup>a</sup>, Aidar Gubaidullin<sup>a</sup>, Igor Strelnik<sup>a</sup>, Vasily Babaev<sup>a</sup>, Kirill Kholin<sup>a</sup>, Irek Nizameev<sup>a</sup>, Elvira Musina<sup>a</sup>, Rafil Khairullin<sup>b</sup>, Andrey Karasik<sup>a</sup>, Asiya Mustafina<sup>a</sup>

<sup>a</sup> Arbuzov Institute of Organic and Physical Chemistry, FRC Kazan Scientific Center of RAS, Arbuzov str., 8, 420088, Kazan, Russia

<sup>b</sup> Kazan (Volga region) Federal University, Kremlyovskaya str., 18, 420008, Kazan, Russia

\*Corresponding author: [969\\_969@bk.ru](mailto:969_969@bk.ru)

### 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)<sub>2</sub>L with cyclic PNNP ligand (L). The synthesis is based on solvent mediated aggregation of (AuCl)<sub>2</sub>L in aqueous organic solutions. Instability of (AuCl)<sub>2</sub>L in aqueous organic solutions was minimized by specific hydrophilic shell deposition arisen from electrostatically driven adsorption of polyethylenimine onto (AuCl)<sub>2</sub>L-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<sup>+</sup> ions. The thiol-induced stripping of Au<sup>+</sup> ions from the colloids quenches the luminescence. The optimal conditions for fluorescent recognition of cysteine, homocysteine and glutathione with lower detection limits about 1 μM are highlighted in the work.

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

### 1.Introduction

Heavy-metal complexes with d<sup>10</sup> 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

Download English Version:

<https://daneshyari.com/en/article/11009830>

Download Persian Version:

<https://daneshyari.com/article/11009830>

[Daneshyari.com](https://daneshyari.com)