

Accepted Manuscript

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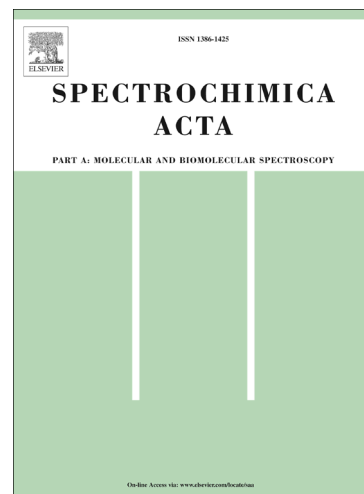
PII: S1386-1425(15)00531-4
DOI: <http://dx.doi.org/10.1016/j.saa.2015.04.059>
Reference: SAA 13610

To appear in: *Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy*

Received Date: 4 March 2015
Revised Date: 11 April 2015
Accepted Date: 14 April 2015

Please cite this article as: S. Bothra, R. Kumar, R.K. Pati, A. Kuwar, H-J. Choi, S.K. Sahoo, Virgin silver nanoparticles as colorimetric nanoprobe for simultaneous detection of iodide and bromide ion in aqueous medium, *Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy* (2015), doi: <http://dx.doi.org/10.1016/j.saa.2015.04.059>

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Virgin silver nanoparticles as colorimetric nanoprobe for simultaneous detection of iodide and bromide ion in aqueous medium

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Abstract

A simple colorimetric nanoprobe based on virgin silver nanoparticles (AgNPs) was developed for the selective detection of iodide and bromide ions via aggregation and anti-aggregation mechanism. With addition of I⁻ ions, virgin AgNPs, in presence of Fe³⁺, showed perceptible color change from yellow to colourless along with disappearance of surface plasmon resonance (SPR) band of AgNPs at 400 nm. But in presence of Cr³⁺, AgNPs turned yellow upon addition of I⁻ and Br⁻ anions. The developed virgin AgNPs probe showed high specificity and selectivity with the detection limits down to 0.32 μM and 1.32 μM for I⁻ ions via two different mechanistic routes. Also, the designed probe detects Br⁻ with a detection limit down to 1.67 μM.

Keywords: Colorimetric sensor, AgNPs, iodide, bromide.

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