

## Accepted Manuscript

Green synthesis of size controllable gold nanoparticles

Kesarla Mohan Kumar, Badal Kumar Mandal, Hoskote A Kiran Kumar, Sireesh Babu Maddinedi

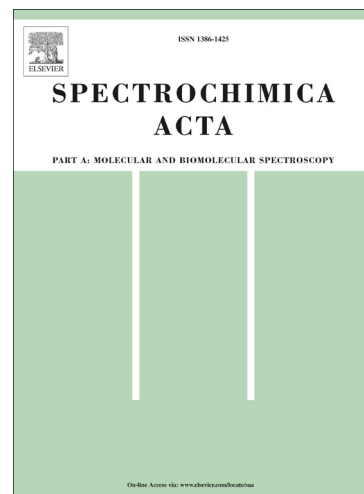
PII: S1386-1425(13)00825-1  
DOI: <http://dx.doi.org/10.1016/j.saa.2013.07.077>  
Reference: SAA 10821

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

Received Date: 11 June 2013  
Revised Date: 16 July 2013  
Accepted Date: 21 July 2013

Please cite this article as: K.M. Kumar, B.K. Mandal, H.A.K. Kumar, S.B. Maddinedi, Green synthesis of size controllable gold nanoparticles, *Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy* (2013), doi: <http://dx.doi.org/10.1016/j.saa.2013.07.077>

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.



# Green synthesis of size controllable gold nanoparticles

Kesarla Mohan Kumar<sup>a, b</sup>, Badal Kumar Mandal<sup>a,\*</sup>, Hoskote A Kiran Kumar<sup>a</sup>, Sireesh Babu Maddinedi<sup>a</sup>

<sup>a</sup>*Trace Elements Speciation Research Laboratory, Environmental and Analytical Chemistry Division, School of Advanced Sciences, VIT University, Vellore-632014, India.*

<sup>b</sup>*Department of Basic Science, Madanapalle Institute of Technology, Madanapalle - 517 325, Andhrapradesh, India.*

AUTHOR EMAIL ADDRESS: [badalmandal@vit.ac.in](mailto:badalmandal@vit.ac.in); [badalkmandal@gmail.com](mailto:badalkmandal@gmail.com)

## Abstract

A facile rapid green eco-friendly method to synthesize gold nanoparticles (Au NPs) of tunable size using aqueous *T. arjuna* fruit extracts has been demonstrated herein. Formation of Au NPs was confirmed by Surface Plasmon Resonance (SPR) study at 528 nm using UV–visible spectrophotometer. The time of reduction, size and morphological variations of Au NPs were studied with varying quantities of *T. arjuna* fruit aqueous extracts. Synthesized Au NPs were characterized using UV–vis spectroscopy, Fourier transformed infrared spectroscopy (FT-IR), powder X-ray diffraction (XRD), transmission electron microscopy (TEM) and Energy dispersive X-ray spectroscopy (EDAX). Polyphenols responsible for reduction of Au<sup>3+</sup> to Au<sup>0</sup> were identified using High Performance Liquid Chromatography (HPLC) as ascorbic acid, gallic acid and pyrogallol. The oxidized forms of polyphenols formed coordination with surface of Au NPs which protected their further growth and aggregation. We also propose a plausible mechanism how to tune size and shape of Au NPs by varying the quantity of extracts. Thus obtained Au NPs were stable for more than four months.

Download English Version:

<https://daneshyari.com/en/article/7673376>

Download Persian Version:

<https://daneshyari.com/article/7673376>

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