

July 12-13, 2018  
Paris, FranceNano Res Appl 2018, Volume 4  
DOI: 10.21767/2471-9838-C2-012

# PHYTOSYNTHESIS OF AG, AU AND AG-AU BIMETALLIC NANOPARTICLES USING GOLDEN ROD (SOLIDAGO CANADENSIS) PLANT AND ITS RELATED CYTOTOXICITY

Elias E Elemike<sup>1,2,3</sup>, Damian C Onwudiwe<sup>1,2</sup>, Victor Wepener<sup>4</sup>, Suranie Horn<sup>4</sup>, John P Giesy<sup>5</sup>, Omolola Fayemi<sup>1,2</sup>, E E Ebenso<sup>1, 2</sup> and Tarryn Lee Botha<sup>4</sup>

<sup>1</sup>MaSIM-FAST, North-West University, South Africa

<sup>2</sup>North-West University, South Africa

<sup>3</sup>Federal University of Petroleum Resources, Nigeria

<sup>4</sup>North-West University, South Africa

<sup>5</sup>University of Saskatchewan, Canada

**S**ilver, Gold and Silver-Gold bimetallic (BNP) nanoparticles have been synthesized in this work using golden rod leaf extracts. In typical biosynthesis reaction, the precursors  $\text{HAuCl}_4 \cdot x\text{H}_2\text{O}$ ,  $\text{AgNO}_3$  were differently and jointly mixed with aqueous extract of golden rod leaf and heated with stirring for 1 h. There were periodic changes in colour which reflects formation of plasmon bands as confirmed by UV-Vis spectroscopy. The different sizes of the nanoparticles were determined using XRD and TEM instruments while the bio reductants were examined using FTIR. In the BNPs, both Au and Ag were detected in the NP system. This observation reinforces the assertion that the plant biomolecules works to suppress the oxidation of Ag by Au and is key in forming Ag-Au alloy structures instead of hollow Au shells or core shells. Formation of Ag, Au and alloy Ag-Au bimetallic nanoparticles were evidenced by the appearance of bands at 420nm, 560nm and 530 nm respectively. The size and shape of Ag-Au bimetallic resemble the pure AuNPs more than the AgNPs. The cytotoxicity of the nanoparticles was equally studied using H4IIE-*luc* rat hepatoma cells by xCELLigence method and from the results, Ag and Ag-Au bimetallic showed little toxicity which may be due to the agglomeration experienced as shown by the TEM results while AuNPs recorded no toxicity.

chemphilips@yahoo.com