

7<sup>th</sup> World Convention on

# WASTE RECYCLING AND REUSE

May 16-17, 2018 Tokyo, Japan

## Low-cost mercury(II) ion sensor by biosynthesized silver nanoparticles (AgNPs)

**Nour El-Houda**

Monastir University, Tunisia

Green nanoparticle synthesis is a novel way to synthesize nanoparticles using biological sources. In the present study, we reported the aqueous extract of *Abelmoschus esculentus* as a stabilizer and reducing agent of silver nitrate to produce silver nanoparticles (AgNPs) in basic medium (pH 10-11) and in neutral medium without and with purification by dialysis (cut of 25 kDa). This process was carried out by two techniques: A simple and eco way and the other was assisted using microwave. It was noted that the synthesis process was considerably fast and silver nanoparticles were generated within minutes as silver ions meeting the biomass extract. A peak at 445 nm corresponding to the plasmonic absorbance of AgNPs was noted in the UV-Vis spectrum of the aqueous medium containing silver ions. SEM and TEM characterizations revealed that the size of AgNPs was in the range of nanometers. The FTIR analysis of the nanoparticles indicated to the presence of protein which concerned as a styling agent surrounding the AgNPs. This AgNP was further tested for the detection of  $Hg^{+2}$  present in water by the colorimetric method. As soon as the  $Hg^{+2}$  solution was added to AgNP, a new peak at about 725 nm appeared with the peak at 430 nm. The new peak may be due to aggregations that occurred with the recognition of the heavy metal ion  $Hg^{+2}$  by AgNPs. A calibration curve between the ratios of the absorption coefficients of these two peaks (Ex430/725) and the concentration of  $Hg^{+2}$  has been established for the estimation of  $Hg^{+2}$  presents in water. This sensor also allows a quantitative assay of the analyte in a neutral aqueous solution with LD of  $10^{-4}M$ .

### Biography

Nour El-Houda has obtained her PhD in the Department of Chemical at the University of Monastir, Tunisia, working in the field of the identification and rheological characterization of biopolymers products. She also has developed her research activity in other prestigious centers such as Laboratories Polymers, Biopolymers and Membrane, CNRS-Rouen University, France and in Laboratory of Glycobiology. She has several scientific publications in reputable international journals and some communications to scientific international conferences on polymers, water treatment and rheology.

msakninourelhouda@yahoo.fr