EuroSciCon

JOINT EVENT

22nd International Conference on

Advanced Materials and Simulation

&

22nd Edition of International Conference on

Nano Engineering & Technology

December 10-12, 2018
Rome, Italy

Benediktas Brasiunas et al., Nano Res Appl 2018, Volume 4
DOI: 10.21767/2471-9838-C7-028

Preparation of gold nanostructures conducting polymer composites for electrochemical and optical sensors

Benediktas Brasiunas, Anton Popov, Arunas Ramanavicius, Anzelika Damaskaite and Almira Ramanaviciene

Vilnius University, Lithuania

Electrochemical arrays and sensors can be made from conducting polymers and applied in different fields such as environmental and biomedical sciences and industry front due to their attractive physical and chemical properties. Conducting polymers are not expensive and easy to synthesize while being distinguished by good stability and electrical conductivity. Nanotechnology and nano science have a significant impact on analytical chemistry, medicine, pharmacy and is still growing every year. Gold nanoparticles and nanostructures are one of the most widely used metal nano objects due to their desirable physical and optical properties. Combining conducting polymers with gold nano structures can significantly change the optical and electrochemical properties of polymeric films. Gold nanostructures are known as excellent chromophores due to excitation of surface plasmons, leading to higher conductivity and selectivity in addition to a change in optical properties of polymers. The aim of this work was to investigate electrochromic and optical properties of a polymer composite consisting of poly (3, 4-ethylenedioxythiophene) (PEDOT) and polyaniline (PANI) electrodeposited on indium tin oxide (ITO) coated glass pre-modified with gold nano structures (AuNS). Different methods were used for the electrochemical synthesis of AuNS onto ITO coated glass slide. Electrochromic properties, absorbance spectra, conductivity and stability of distinctly modified polymer layers were determined and compared. In addition, sensitivity of formed polymeric films to pH changes was evaluated.

Recent Publications

1. Deshmukh M A, Gicevicius M, Ramanaviciene A, Shirsat M D, Viter R and Ramanavicius A (2017) Hybrid electrochemical/ electrochromic Cu(II) ion sensor prototype based on PANI/ITO-electrode. Sensors and Actuators B Chemical 248:527-535.
2. German N, Popov A, Ramanaviciene A and Ramanavicius A (2017) Evaluation of enzymatic formation of polyaniline nanoparticles. Polymer 115:211-216.
3. Ramanaviciene A, Voronovic J, Popov A, Drevinskas R, Kausaite-Minkstimiene A and Ramanavicius A (2016) Investigation of biocatalytic enlargement of gold nanoparticles using dynamic light scattering and atomic force microscopy. Colloids and Surfaces A: Physicochemical and Engineering Aspects 510:183-189.
4. Mazeiko V, Kausaite-Minkstimiene A, Ramanaviciene A, Balevicius Z and Ramanavicius A (2013) Gold nanoparticle and conducting polymer-polyaniline-based nanocomposites for glucose biosensor design. Sensors and Actuators B: Chemical 189:187-193.
5. Ramanavicius A, Oztekin Y, Balevicius Z, Kausaite-Mikstimiene A, Krikstolaityte V, Baleviciute I, Ratautaite V and Ramanaviciene A (2012) Conducting and electrochemically generated polymers in sensor design (mini review). Procedia Engineering 47:825-828.

Biography

Benediktas Brasiunas is pursuing his Master's degree in Chemistry in the Institute of Chemistry, Faculty of Chemistry and Geosciences at Vilnius University, Lithuania. His subjects of interests and expertise are in nanotechnology, glucose and other reducing sugar sensors and biosensors, conductive polymers and their composites with nanostructures.

benas.brasiunas@gmail.com