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ONOSMA MALATYANA BINZET EXTRACT MEDIATED BIOSYNTHESIS OF AG DOPED ZNO NANOPARTICLES AND ITS SENSING APPLICATION

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ABSTRACT

The fabrication of nanostructured materials have gained much attention in the field of catalysis in recent years by virtue of their unique properties, large surface area, and strong interaction with other materials. Semiconductor-based heterostructures play an important role in nanodevices and sensors applications. ZnO nanostructures are technologically important material and are used in a wide range of applications such as catalysis, photocatalysis, sensors and other industrial applications [1-4]. Similar to other semiconductors, ZnO has poor selectivity or sensor response. ZnO is also doped with noble metals (Ag, Au and Pt) to achieve selectivity and enhance sensor response. In this study, we report a facile, simple and low cost synthesis of Ag doped ZnO nanoparticles using *Onosma malatyana* Binzet root extract. The synthesized Ag doped ZnO nanoparticles were detailed characterized by scanning electron microscopy, X-ray powder diffractometer, UV-vis spectroscopy and dynamic light scattering. In addition we fabricated Ag-ZnO modified carbon paste electrode (AgZnO-CPE) for detection of paracetamol (Figure 1). Figure 1. Typical cyclic voltammogram of bare CPE, ZnO-CPE, Ag-CPE and AgZnO-CPE electrode with 0.1 mM paracetamol in 0.1 M phosphate buffer solution (pH = 7.20) at scan rate 50 mV/s. Inset show magnification of bare CPE and ZnO-CPE response. Keywords: Green synthesis, *Onosma malatyana*, nanoparticle, sensor, paracetamol Acknowledgements This study was supported by the Research Fund of Mersin University in Turkey with Project Number: 2016-1-AP4-1429. References [1] K. Saoud, R. Alsoubaihi, N. Bensalah, T. Bora, M. Bertino, J. Dutta, Synthesis of supported silver nano-spheres on zinc oxide nanorods for visible light photocatalytic applications Materials Research Bulletin 63 (2015) 134-140. [2] B. Sarma, B. K. Sarma, Fabrication of Ag/ZnO heterostructure and the role of surface coverage of ZnO microrods by Ag nanoparticles on the photophysical and photocatalytic properties of the metal-semiconductor system Applied Surface Science 410 (2017) 557-565. [3] R. Kumar, D. Rana, A. Umar, P. Sharma, S. Chauhan, M. S. Chauhan, Ag-doped ZnO nanoellipsoids: Potential scaffold for photocatalytic and sensing applications Talanta 137 (2015) 204-213. [4] Y. Wang, X. He, K. Wang, X. Zhang, W. Tan, Barbated Skullcup herb extract-mediated biosynthesis of gold nanoparticles and its primary application in electrochemistry Colloids and Surfaces B: Biointerfaces 73 (2009) 75-79.

KEYWORDS

Green synthesis, Onosma malatyana, nanoparticle, sensor, paracetamol

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