

## Mem-behaviour of undoped and Cu-doped Zinc Sulphide nanocomposites with or without bacteria conjugation

Himadri Duwarah<sup>1, #</sup>, Neelotapal Sarma<sup>2</sup>, Kandarpa kumar Saikia<sup>3</sup>, Pranayee Datta<sup>4</sup>

<sup>1</sup>Department of Electronics & Communication Technology, Gauhati University, Guwahati-781014, India.

<sup>2</sup>Department of Bioengineering & Technology, Gauhati University, Guwahati 781014, India.

#Email: [himadriduwarah@yahoo.co.in](mailto:himadriduwarah@yahoo.co.in)

**Abstract:** This paper presents synthesis, characterization and application of undoped and Cu-doped Zinc Sulphide (ZnS) nanocomposites for sensing *E.coli* bacteria. Aqueous precipitation and wet chemical methods are used for synthesis of nanocomposites. UV-Vis, PL, SEM, TEM results confirms nanoformation. *E.coli* bacteria are conjugated to the as-synthesized nanoparticles and their antimicrobial effects are tested by nutrient broth method. Devices are fabricated with ITO and Cu as the electrodes and as-synthesized nanosamples (with or without bacteria conjugated) as active region. Observed I-V characteristics of the as-fabricated device exhibiting mem-behaviour points towards their application as biosensors.

**Keywords:** Nanocomposites, antimicrobial, mem-behaviour.

### References:

- [1] P. J. Vikesland et al., Nanomaterial Enabled Biosensor for pathogen Monitoring-AReview Environmental Science & Technology, Vol. 44, No.10.2010.3656-3669.
- [2] N. Kaur et al., A Review on Zinc Sulphide Nanoparticles: From Synthesis, Properties to applications. Journal of Bioelectronics to Nanotechnology, December 2016, Vol.1.
- [3] S. Carrara et al., Memristve-biosensor: A new detection method by using nanofabricated memristors', Journal of Sensors and Actuators, B 171-172(2012)449-45.
- [4] S. Barua et al., Manganese Doped Zinc Sulphide Quantum dots for detection of Escherichia coli. J. Fluoresce (2012) 22:403-408.
- [6] Puppo et al., Memristor Based device for sensing, 2014, IEEE.