

## A Novel Electrospun PU@CuS Hybrid Nanofiber Composite: Synthesis and Morphology Characterization

Sudeep M<sup>1</sup>, Manjunatha C<sup>2,3</sup> \*, Sham Aan M P<sup>2</sup>, Ujwal Shreenag Meda<sup>1,3</sup>

<sup>1</sup>Department of Chemical Engineering, RV College of Engineering, Bengaluru-560059, INDIA

<sup>2</sup>Department of Chemistry, RV College of Engineering, Bengaluru-560059, INDIA

<sup>3</sup>Centre for Hydrogen and Green Technology Research (CH<sub>2</sub>GTR), RV College of Engineering, Bengaluru-560059, INDIA

\*Corresponding author

E-mail addresses: [manjunathac@rvce.edu.in](mailto:manjunathac@rvce.edu.in); [manju.chem20@gmail.com](mailto:manju.chem20@gmail.com) (Manjunatha.C).

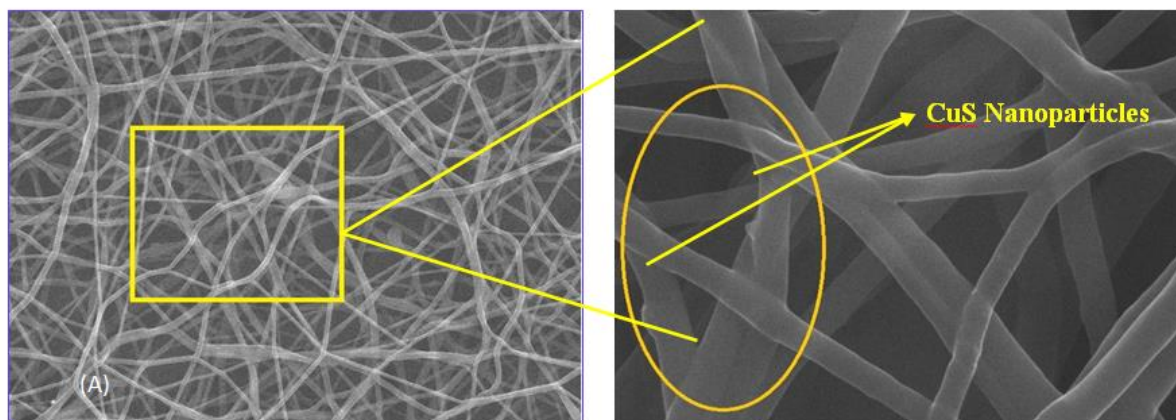
ORCID: <https://orcid.org/0000-0003-0422-9614>; Phone: +91 9036651277



### Abstract

Till date, materials researchers are facing the major challenge for effective processing of nanocomposites with polymeric matrix with satisfactory dispersion of the nanometric phase, as well as a suitable interface between the polymer phase and the nanoparticle. Polyurethane (PU), being most commercialized polymer finding its place in various engineering application such as mechanical, electronic, and biomedical field and found to be more useful in combination with inorganic nanoparticles. In this study we report the development and characterization of nano CuS embedded polyurethane fiber composite. The PU nanofibers were electrospun by optimizing the parameters namely, applied electric potential, concentration, flow rate. Scanning electron microscope (SEM) images of the PU nanofibres electrospun at 13kV, 1ml/h and 10wt% showed appearance of uniform mat having a fiber diameter of 175 nm. CuS nanoparticles were synthesized by hydrothermal method employing three types of surfactants. The effect of polar and non polar solvent on particle size and morphology has also been investigated. Further, the CuS embedded PU/CuS nanofiber composite was developed by electrospinning.

**Keywords:** Electrospinning; Hydrothermal; CuS; Polyurethane; Nanofibers; Hybrid composite



**Fig. 1:** SEM image of nano CuS embedded PU fiber composite

**Conclusions:** In summary, we have developed a novel PU/CuS electrospun nanofiber composite, by investigating the effects of electrospinning parameters on fiber diameter.

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