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Departmental Seminar

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Seminar Title	: Development and characterisation of lignin/polyvinyl alcohol polymeric nanofibrous mat using food waste derived lignin
Speaker	: Sayantan Ghosh (522bm1003)
Supervisor	: Dr. Nivedita Patra
Venue	: BM Department Seminar Room
Date and Time	: 24 Dec 2024 (11.40 AM)
Abstract	: The increasing global concern over environmental sustainability has prompted the exploration of alternative, environment-friendly materials derived from renewable resources. One such promising strategy is the utilization of food waste-derived lignin for the development of electrospun nanomaterials. The present study reports on the development of nanofibrous mats by electrospinning technology using lignocellulosic food waste-derived lignin biopolymer. Lignin was extracted and characterised from potato peel waste using a green choline-chloride oxalic acid deep eutectic solvent. A blend of extracted lignin and polyvinyl alcohol (PVA) copolymer was electrospun into nanofibrous mat at 14 kV operating voltage and 0.3 ml/hr flow rate. The developed lignin/PVA nanofibrous mat was characterized using field emission scanning electron microscopy (FESEM), Energy dispersive X-ray analysis (EDAX), X-ray diffraction (XRD), and Fourier-transform infrared spectroscopy (FTIR), to assess their morphology, structure, and chemical composition. FESEM images demonstrated the production of uniform lignin/PVA nanofiber mats having interconnected pores. The elemental content of the developed nanofiber was confirmed from EDAX. FTIR spectra revealed the presence of key lignin functional groups like syringyl and hydroxyl and aromatic ring in the nanofiber, whereas XRD analysis showed the amorphous nature of lignin/PVA nanofiber. In conclusion, a lignin/PVA polymeric nanofibrous mat was successfully fabricated by electrospinning, which can be further tested as a membrane adsorbent in the field of pollutant remediation. Keywords: Lignin, food waste, DES, nanofibrous mat, characterisation, Electrospinning ALL ARE CORDIALLY INVITED