National Institute of Technology Rourkela

Registration Seminar

Seminar Title	: Development of superhydrophobic phenol formaldehyde modified melamine-formaldehyde sponge for toxic dye removal and oil spill remediation
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Venue	: Seminar Room, CR
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Abstract : Rapid industrialization and urbanization pose severe threats to freshwater pollution during oil spills/leakage, and organic effluent discharge into water bodies may have a terrible impact on the aquatic ecosystem. Therefore, specialty porous sorbents suitable for quick oil-water separation have attracted tremendous academic and industrial interest in the past several years. The ability of three-dimensional porous sorbents to separate and recover lost oil from water is considered an efficient, eco-friendly, and cost-effective strategy. In the present work, we demonstrate the preparation of porous carbon spheres modified superhydrophobic melamine formaldehyde sponge (PCS@MF) for ultra-fast oil-water separation and industrial dye removal. In this regard. MF sponge was modified by PCS derived from resorcinol- formaldehyde (RF) polycondensation reaction using a dip coating method, followed by pyrolysis at a moderate temperature. XRD, FTIR, Raman spectroscopy, FESEM, and EDS confirm the successful surface modification of MF sponge by RF resin and the formation of PCS@MF sponge after carbonization. The PCS@MF sponge shows a contact angle of 169°, 79°, and 0° for sessile water droplets in air, oil, and oil in air, respectively. The PCS@MF sponge demonstrated absorption of numerous oil mixed with water by 68-85 times separation by its mass in the first cycle. Further, the RF resin and RF@MF sponge were explored for the removal of methylene blue dye with ~98% efficiency. The abovementioned findings have ample rationale to believe that the strategy adopted herein will provide an easy and environmentally benign method for synthesizing porous sorbents for wastewater treatment in the future.