
Departmental Seminar

Seminar Title	: Development of Modified Microporous Elastomeric Sponges for Efficient Oil-Water Separation
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Venue	: BM Department Seminar Room
Date and Time	: 19 May 2025 (04:00 PM)
Abstract	: Oil pollution significantly impacts the environment and has become a chronic issue for marine and freshwater ecosystems. However, developing a sponge-like material capable of effectively absorbing and retaining oil on the surface is a promising approach. The sponge, potentially reused repeatedly, significantly reduces the impact of oil spills. In this study, a hydrophobic graphite-based microporous elastomeric sponge is fabricated using a sugar-templating approach. The surface morphology of the elastomeric-graphite sponge is studied by field emission scanning electron microscopy. The chemical composition of the film is analyzed by alpha-attenuated total reflectance - Fourier transform infrared spectroscopy. The films surface hydrophobicity and oleophilic characteristics are analyzed using a goniometer. The elastomeric-graphite sponge absorption and filtration capacity, wettability, and reusability were investigated against gasoline and Cocos nucifera oil. Elastomeric sponge has shown absorption capacity of $530.40 \pm 22.98\%$ and $223.27 \pm 10.63\%$ for gasoline and Cocos nucifera oil, respectively. The modification of elastomer with graphite improved the sponge absorption capacity to $626.15 \pm 15.77\%$ and $264.57 \pm 15.20\%$ for gasoline and Cocos nucifera oil, respectively. In conclusion, the elastomeric-graphite sponge has shown specific absorption for organic solvents/oils. The elastomeric-graphite sponge is able to filter the organic solvents/oils from the water. The compression and reusability assessment has shown that the elastomeric-graphite sponge is able to withstand high stress and is reusable after repeated compressions. Keywords: Absorption, Filter, Graphite, Hydrophobic, Sustainability. ALL ARE CORDIALLY INVITED