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Registration Seminar

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Seminar Title	: Recovery of Carboxylic Acids, Metals, and Dyes Using Hydrophobic Deep Eutectic Solvents
Speaker	: Saiswapna Rautaray ( Rollno : 523ch1004)
Supervisor	: Basudeb Munshi
Venue	: New-Seminar Room (Room No. CH-226, Department of Chemical Engineering)
Date and Time	: 03 Mar 2025 (11.00 AM)
Abstract	<p>: This report details an investigation into the application of the novel Hydrophobic Deep Eutectic Solvents (HDESs) for the recovery of carboxylic acids, metals, and environmental pollutants from aqueous solutions. The introduction provides background on HDESs, highlighting their significance in various applications, particularly within environmental contexts such as water treatment and volatile organic compound separation. A comprehensive literature review follows, focusing on the current state of recovery methods for these target substances. This review identified a research gap in the application of novel HDESs for such recoveries, particularly for diverse carboxylic acids, metals, and pollutants. Consequently, the research objectives were defined as the recovery of these substances from aqueous solutions using novel HDESs.</p> <p>The experimental phase of this study focused on the extraction of valeric acid (VA) as a representative carboxylic acid. A HDES was synthesized using menthol and TOPO as components. Reactive liquid-liquid extraction (RLLE) was employed, utilizing this HDES to extract VA. A systematic investigation was conducted to determine the influence of key extraction parameters, including molar ratio, extraction time, temperature, and initial acid concentration. Fourier-transform infrared spectroscopy (FTIR) was used to confirm the transfer of valeric acid from the aqueous to the organic phase. Furthermore, a thermodynamic study was performed to elucidate the reaction mechanism, revealing the exothermic and spontaneous nature of the extraction process. Optimal extraction performance was observed at a 0.1 M initial acid concentration and a temperature of 308.15 K, yielding an extraction efficiency of 98.99% and a distribution coefficient of 98.009.</p>