

## IONIC LIQUID RESEARCH LABORATORY

### Faculty Details:



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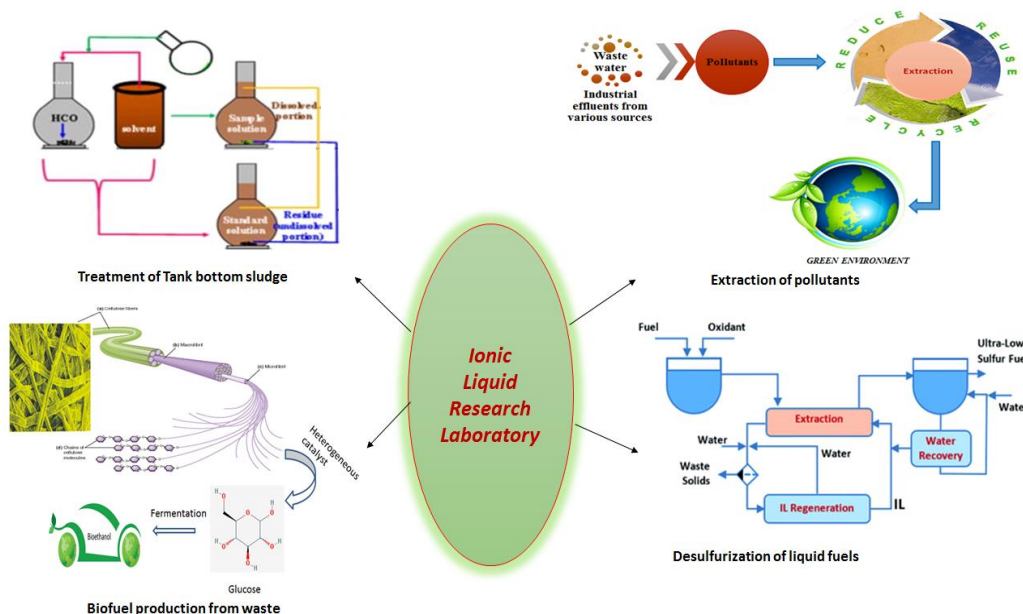
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### **About the Laboratory:**

The major research areas of this lab are Waste water treatment, Bioethanol production, Treatment Crude oil Sludge treatment, Desulphurization of Petroleum products, Separation of bio-active compounds from fruit waste and Biofuel production. The main purpose of this lab is the usage of Ionic Liquids (Green solvents) for above fore-mentioned research works so as to prevent creating a secondary waste, toxic emission of solvent to the environment and to produce energy from wastes. Research work is also extended in the recovery and reuse of Ionic liquids. The research works critically aims for a cleaner, greener environment and production of energy from various bio-sources for a healthy future.

In waste water treatment process, for heavy metals removal, the treatment methods used are solvent extraction, Nanoparticle based Adsorption, Dispersive Liquid-Liquid micro extraction (DLLME) methods. In future research will be extended in using Ionic Liquid analogues in targeting the complete removal of pollutants from waste water, which will pave way for technology transfer and patents. In biofuel production, studies are reported using novel catalyst for the effective conversion of biomass to biofuel. From fruit wastes, bio-active compounds such as higher alkenes, Ascorbyl palmitate, and squalene etc., were identified and separated. Extraction of carotenoids from melon shells were carried out. In crude oil sludge treatment process, solubility of petroleum sludge/ tank bottom sludge using Ionic liquid analogues were studied and attempted to recover the dissolved petroleum products. Studies were carried out to remove the aromatic sulphur and also the various sulphurforms from the petroleum products.



## Accomplishment:

The research works were published in various reputed Journals, selected journals are given below;

1. “Multivariate response optimization of Pb(II) extraction from wastewater using Box-Behnke design” Chemical Papers (2022). <https://doi.org/10.1007/s11696-021-02054-3>
2. “A systematic approach of using green solvent for the extraction of Pb (II) from aqueous solution”. International Journal of Environmental Science and Technology, Vol.19, issue 3, 1369-1382, (2021). <https://doi.org/10.1007/s13762-021-03126-3>
3. “Dispersive liquid-liquid microextraction of zinc from environmental water samples using ionic liquid”, Chemical Engineering Communications, Vol. 208, issue 6, 914-923, (2021). <https://doi.org/10.1080/00986445.2020.1865935>
4. “Valorization of fruit waste using des pretreatment and hydrolysis over a heterogeneous catalyst for bioethanol Production”, Biomass conversion and biorefinery (2021). DOI:[10.1007/s13399-021-01669-6](https://doi.org/10.1007/s13399-021-01669-6)
5. “Ionic Liquids to remove toxic pollutants, Environmental Chemistry Letters, volume 19, issue 2,1173-1203, (2020). <https://doi.org/10.1007/s10311-020-01115-5>
6. “Catalytic hydrolysis of fruit waste using magnetic carbon acid catalyst for bioethanol production”, Waste and Biomass valorization **12**, 971–983 (2020). <https://doi.org/10.1007/s12649-020-01019-z>.

7. "Evaluation of chemical reactivity and stability of Ionic Liquids using AB initio and COSMO-RS model", Journal of Computational Chemistry, Vol.41, Issue.9, 885-912, (2020).
  8. "Removal of nickel from aqueous solution using synthesized IL/ZnO", Environmental Science and Pollution Research, Vol.27, Issue.24, 29791-29803, (2019).
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**List of Major Equipment:**

<b>S.No.</b>	<b>Name of the Equipment</b>
1.	Refrigerator
2.	Incubator
3.	Incubator Cum shaker
4.	Muffle furnace
5.	Autoclave
6.	Hot air oven
7.	Microwave oven
8.	Ultrasonic cleaner
9.	Centrifuge
10.	Hot plate with magnetic stirring
11.	pH meter
12.	Electrical Blender

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**List of Research Scholars:**

<b>S. No.</b>	<b>Name</b>	<b>Thesis Title</b>	<b>Year of passing/Status</b>
1	Dr. R. Vijayalakshmi	Studies on removal of Pb(II) from aqueous solution and industrial effluents using green solvents	March 2022 Completed
2	Dr. M. Hemalatha	Catalytic Hydrolysis of Fruit Waste using Heterogeneous Catalyst for Bioethanol Production	March 2022 Completed

3	Neha Saman	Enhanced Microalgae based biodiesel production using the concept of green nanotechnology	Confirmation Completed
4	S. Lokesh Kumar	Production of Alternate Fuels from Seaweeds: A Low-Cost Raw Material	Course Work
5	U. Vidhya Devi	Simultaneous Saccharification and fermentation using novel microbial isolates for Bioethanol production	Course Work

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