

# HITESH YADAV

Master of Science'24 (Physics).  
Indian Institute of Technology, Jodhpur

## Present Address:

Room No. 319, Department of Physics  
Indian Institute of Technology Jodhpur  
N.H. 65 Nagaur Road, Karwar  
Rajasthan, 342030, INDIA  
Email: [m22ph008@iitj.ac.in](mailto:m22ph008@iitj.ac.in)

## EDUCATIONAL QUALIFICATIONS

---

Qualification	Board/University	Year	CGPA/Percentage
Master of Science (M.Sc. Physics)	Indian Institute of Technology, Jodhpur	2022-2024	8.37
Bachelor of Science B.Sc. (Hons.) Physics	Dyal Singh College University of Delhi	2019-2022	8.905
Higher Secondary (10+2)	Central Board of Secondary Education	2019	91.0%
Secondary (10)	Central Board of Secondary Education	2017	10

## AREA OF INTEREST

---

- Soft Matter Physics
- Statistical Physics
- Plasma Physics

## COURSE WORK

---

- **Core Course:** - Mathematical Physics, Quantum Physics, Classical Mechanics, Statistical Mechanics, Electronics, Electrodynamics, Physics of Atoms and Molecules, Condensed Matter Physics, Nuclear, and Particle Physics
- **Elective Course:** - Introduction to Plasma and Fusion Science, Introduction to Material Characterization, Advanced Condensed Matter Physics, Soft Matter Physics, Computational Physics, Introduction to Cold Plasma Technologies, Nanoscience and Nanotechnology and Computational Material Science
- **Lab Courses :** Electronics Lab, Condensed Matter Physics Lab, Atomic and Nuclear Physics Lab, Lasers and Optics Lab

## M.SC. THESIS

---

**Thesis Title-** “*Effect of Fluorinated Ethylene Carbonate (FEC) on ion transport in sodium ion battery electrolytes.*”

**Supervisor-** Dr. Santosh Mogurampelly

**Duration-** 1 Year (ongoing)

### **Brief Description**

In this work, we use atomistic molecular dynamics simulations to study the structure and ion transport characteristics of PEO-NaPF<sub>6</sub> electrolytes and examine their dependency on fluorinated ethylene carbonate (FEC). We want to study how diffusion coefficient is correlated with polymer friction coefficient and relaxation time in presence of FEC. Our simulations reveal that the diffusion coefficient of PF<sub>6</sub><sup>-</sup> is higher than that of the Na<sup>+</sup> ions due to weaker interactions of PF<sub>6</sub><sup>-</sup> with polymer. Further, the ion diffusion and Nernst Einstein Conductivity is found to increase monotonically with the loading of FEC. The increase in diffusion is observed to arise because of the FEC-induced faster ion-ion relaxations in the electrolyte also diffusion coefficient is excellently correlated with polymer friction coefficient.

## COMPUTER/ SOFT SKILLS

---

- **Technical Skills:** Project Experience with GROMACS, Xmgrace, Visual Molecular Dynamic (VMD), GNUPLOT, MATLAB, and MS Office.
- **Platforms:** Windows, Linux (Ubuntu).

## ACADEMIC ACHIEVEMENTS

---

- Qualified IIT JAM (Masters entrance exam for top institutes in India) Physics in 2022 with All India Rank 527 out of around 12,000 applicants
- Qualified GATE (Graduate Aptitude test in Engineering) Physics in 2023 with All India Rank 1679 out of 18,000 applicants
- Qualified GATE (Graduate Aptitude test in Engineering) Physics in 2024 with All India Rank 1343 out of 20,000 applicants

## Submitted Manuscripts

---

Teherpuria, H., Yadav, H., Mohapatra, S., Mogurampelly, S., Polymer alignment Induced changes in ion solvation structure in EC-LiTFSI electrolytes, *Soft Matter* (in review) (2024)

## Manuscripts Under Preparation

---

Effect of Fluorinated Ethylene Carbonate (FEC) on sodium ion battery electrolytes

## CONFERENCES & WORKSHOPS

---

- Attended 5<sup>th</sup> ADITYA L1 (India’s first solar mission) support cell workshop at IIT Kanpur (India).
- Presented Poster in Complex Fluids Conference at Indian Institute of Technology Madras (India).

## HOBBIES

---

- Playing and Watching Cricket
- Physical fitness

## DECLARATION

---

I now declare that all the information given is correct to the best of my knowledge

**Date: April 8, 2024**

**Hitesh Yadav**

