Dev Raj

Final Year, RGIPT | Chemical Engineering Undergraduate

Male| 05/12/2001

✆ (+91)-7643027266 | eche19018@rgipt.ac.in, devraj5122001@gmail.com| dev-raj-aa271b194

OBJECTIVE

A highly dedicated, hardworking individual who strives to remove hurdles to the nation's self-reliance and development. Looking for an organization as a learning role that will enable me to solve real-life problems utilizing the field of evolving research, my chemical engineering knowledge, and laboratory experience.

EDUCATIONAL BACKGROUND

COURSE	INSTITUTE	CPI/CGPA/%	YEAR
B.Tech in **Chemical Engineering**	Rajiv Gandhi Institute of Petroleum Technology	8.73*/10	2019-2023
XII, (BSEB)	Laxmi Rajdeo +2 School	71.6%	2019
X, (CBSE)	Holy Central School	10/10	2016

* till 5th Semester

INTERNSHIP

➢ **FORMULATION AND ANALYSIS OF DILUTABLE SKIN CLEANSING TABLETS | Hindustan Unilever Limited R&D Center (HUL R&D), Bangalore** *May 16 – September 30, 2022*

Mentor**: Swathi S (Asst. Research Scientist-PE), Saswati Pujari (Sr. Research Scientist-PE)**

- Literature survey of surfactant science, ingredients and critical factors in skin cleansing products, and tablet disintegration science (which is more common in pharmaceutical industry as Fast or Oral dissolving Tablets).
- Developed novel tablets for different brands of Hindustan Unilever Limited and analyze the critical parameters which affect disintegration time, dissolution time, pH, sensory, stability etc., in formulation physically and chemically at the laboratory level for future scale-up of products.
- Characterization of Tablet Hardness, Stability and foam evaluation after post dilution through Dynamic Foam Analyzer, formation of phases during dilution.

(PE-Product Engineering)

➢ **PREPARATION OF HIGH SELF-HEALING EFFICIENCY CROSSLINK GLYCIDYL AZIDE POLYMER (GAP) VIA SIMULTANEOUS DISULFIDE LINKAGE AND ALKYNE-AZIDE CLICK CHEMISTRY | Defence Institute of Advanced Technology (DU DRDO), Pune** *January 10 – February 12, 2021*

Mentor**: Dr. Shaibal Banerjee (Associate Professor, HOD)**

- Literature survey of chemistry involved in self-healing and their efficiency to overcome the problem of debonding of interface between propellant grain and propellant coating.
- Reaction scheme was developed for self-healing of GAP by taking energetic performance into also account.
- Preparation of self-healing efficiency crosslink of GAP via simultaneous disulfide linkage and click chemistry.

➢ **DEVELOPMENT OF SAFER AND COST-EFFECTIVE REACTION SCHEME FOR THE SYNTHESIS OF CL-20, A POWERFUL HIGH EXPLOSIVE | Defence Institute of Advanced Technology (DU DRDO), Pune**

Mentor**: Dr. Shaibal Banerjee (Associate Professor, HOD)** *January 10 – February 12, 2021*

- Literature survey on synthesis of CL-20.
- Reaction scheme was developed for CL-20 which is safer and cost-effective route.

PROJECTS

➢ **STUDY AND DEVELOPMENT OF HIGH ENTROPY ALLOYS (HEAS) FOR VARIOUS APPLICATIONS LIKE HYDROGEN STORAGE, HIGH TEMPERATURE, COATINGS** *August 1 – December 20, 2021*

Mentor**: Dr. Deepak Dwivedi & Prof. A.S.K. Sinha**

- Literature survey of High entropy Alloys for hydrogen storage, high temperature and coating application.
- Learnt and understood the Spark Plasma Sintering (SPS).
- Finalize the different high entropy alloy system for hydrogen storage and coating application.

➢ **NEW PROPOSED DESIGN AND PROCESS ASPECT FOR WASTE HEAT RECOVERY FROM SLAG GRANULATION AND ITS UTILIZATION** *July 1 – January 15, 2021*

Mentor: **Dr. Deepak Dwivedi & Prof. A.S.K. Sinha**

- Literature survey of waste heat recovery and utilization of different slag mainly from iron and steel industry.
- Proposed design includes the concept of mechanical activation, magnetic separation, and impact energy.
- Techno-economic feasibility aspect was discussed for the proposed design with the guide.

➢ **CONTROLLING THE SIZE DISTRIBUTION AND YIELD OF KNO_3 IN AQUEOUS MEDIUM**

Mentor: **Dr. V.S. Sistla** *December 2019- April 2020*

- Preparation of micrometer-sized KNO_3 crystal with various experimental condition like stirring rate, cooling rate and solvent/antisolvent.
- Characterization of crystals by Dynamic Light Scattering (DLS) for particle size distribution, FTIR and Thermogravimetric analysis (TGA) for thermal decomposition.
- Comparing the results of Particle size distribution and thermal decomposition via Direct crystallization and Antisolvent crystallization.

PUBLICATIONS

- **Dev Raj**, Alok Kumar, Rohit Kumar Singh, Abhishek Singh Bhadouria, A.S.K.Sinha*, Deepak Dwivedi*, **Application of Advanced Nuclear Analytical Techniques for the Electrocatalyst's Characterization: Paving the Path for Mechanistic Investigations**, *Current Opinion in Electrochemistry*; 2022, 100958, https://doi.org/10.1016/j.coelec.2022.100958 *(Impact Factor ~ 7.27)*
- Abhishek Singh Bhadouria†, Alok Kumar†, **Dev Raj**†, Anshika Verma, Sukriti Singh, Prerna Tripathi, Yogendra Kumar, A.S.K. Sinha*, N. M. Tripathi*, A. M. Yeneneh*, Deepak Dwivedi*; **Corrosion Mitigation in Oil Reservoirs during CO_2 Injection using Nanomaterials**, *Nanotechnology for CO_2 Utilization in Oilfield Applications*, 2022, 127-146, https://doi.org/10.1016/B978-0-323-90540-4.00014-4 (Book Chapter)
- Tahereh Jafary, Anteneh Mesfin Yeneneh*, Jimoh Adewole, Asma Al Kharousi, Thirumalai Kumar, **Dev Raj**, Alok Kumar, Prerna Tripathi, A.S.K. Sinha, Deepak Dwivedi*; **Current advances, challenges and prospects of CO_2 capture, storage and utilization, Nanomaterials**, *Nanotechnology for CO_2 Utilization in Oilfield Applications*, 2022, 167-193, https://doi.org/10.1016/B978-0-323-90540-4.00015-6 (Book Chapter)

'*' denotes the corresponding author;
'†' denotes equally contributed first author

ACHIEVEMENTS AND HONOURS

- Ranked in the top 2% (Among 1,500,000 appearing students) in **IIT-JEE** 2019.
- Among **640 research ideas** nationwide in the "**New Generation Ideation Contest" (NGIC-2021),** conducted by **HPCL**:
  - Our team got selected in the **Top 5** and won commendation prize for 1st research idea **"MgB_2-Aspartic acid (ASP)-Layered Double hydroxide (LDH) as a super corrosion resistance material under CO_2 corrosion condition"** and
  - For 2nd research idea **"Vitrimer based PDMS coatings for corrosion prevention in Oil & Gas industries",** our team got selected in the **Top 40.**
- Successfully completed training program on "**Industrial Corrosion and Control**" organized by Electrochemical Society of India.
- Awarded with Certificate of Appreciation for successfully **contributing 100 hours at Gyanarpan, an Initiative under Project Amethi.**

TECHNICAL SKILLS

- **Programming Languages:** C, FORTRAN
- **Software:** Autodesk AUTOCAD, MS Excel (Basic), MS Word (Basic), MS Powerpoint (Basic), MATLAB, Aspen plus

EXTRA-CURRICULAR ACTIVITIES/PORs

- **Teaching Volunteer** (2019-2021), Gyanarpan (Social service council of RGIPT under Project Amethi)
- **Tutor** (December'21- March'22), Real Analysis & Calculus (B.Tech 1st year students)
- **Event Management member** of college sports fest "ENERGIA" 2019-2020
- **General Affairs Head** (2021-2022) at E-Cell, RGIPT