



# Indian Institute of Technology Jodhpur

## Office of Research and Development

Advt. No.: IITJ/R&D/2021-22/28

17 September 2021

### Project Recruitment

Applications are invited from the citizen of India for filling up the following temporary position in the Sponsored Research Project at this Institute. The position is purely temporary, initially for a period of 09 Months, and extendable but co-terminus with the duration of the project, on contractual basis with consolidated pay. The requisite qualification, experience and others details are given below:

1.	Project No.	S/SERB/DA/20200044
2.	Project Title	Controlled Morphologies via Phase-separation in Epoxy Blends for Electronic Sensor & Device Packaging
3.	Name of the Project Investigator	Dr. Deepak Arora
4.	Duration of Initial Appointment	09 Months
5.	Name of Initial Appointment	Junior Research Fellow
6.	Post	01
7.	Consolidate Pay	Rs.31,000/-
8.	Minimum Qualification and Experience	<p><u>Essential Qualification:</u> B.E./ B.Tech. in a relevant discipline such as Chemical Engineering, Materials Engineering, Polymer Science &amp; Engineering, Electrical Engineering, Packaging Engineering etc and NET/ GATE qualified.</p> <p><u>Experience:</u> Courses Done in fundamentals of polymers</p> <p><u>Desirable:</u> B.E./ B.Tech + M.E./ M.Tech. or higher degree in a relevant discipline such as Chemical Engineering, Materials Engineering, Polymer Science &amp; Engineering, Electrical Engineering, Packaging Engineering etc.</p> <p><u>Experience:</u></p> <ul style="list-style-type: none"><li>• Advanced courses done in polymers, polymer rheology, epoxies and relevant domains.</li><li>• Hands on laboratory experience in polymer synthesis and formulation.</li><li>• Hands on experience in device/ sensor fabrication.</li><li>• Experienced with equipments such as spin coater, rheometer, DSE, DMA, SEM, AFM optical microscope, FTIR etc</li></ul>

		<ul style="list-style-type: none"> <li>• Experience with microfabrication.</li> </ul>
09	Job Description	<ul style="list-style-type: none"> <li>• A Junior research fellow will help in executing the research project and relevant work in the area of cross linking of epoxy blends.</li> <li>• Person will be involved in manuscript preparation for submission to journals and conferences.</li> <li>• Helping in procurement of equipment and accessories, and the testing and installation.</li> </ul>
10	Brief description of Project	<p>Electronic packaging involves packing a semiconductor device, such as chip, memory, photodiodes, LED, etc. with various other components, in an organic, ceramic or composite environment. Electronic packages find their application in traditional industries including computing, automotive, aerospace, and mobile. The advent of new industries as artificial intelligence, autonomous cars, smart homes, smart cities and the Internet of Things (IoT) has provided a renewed thrust to the electronic packaging. This has pushed the requirements for reliability and performance in terms of tighter feature dimensions for dense packages. This imposes additional requirements on the polymer dielectrics that are implemented in the manufacturing of electronic packages. In particular, polymer dielectrics are expected to have better rheological and mechanical properties, higher glass transition temperatures, better elongation and improved adhesion with various interfaces while offering ease of processing and benefits of low cost. Epoxy resins are some of the crucial polymeric resins for electronic packaging and semiconductor industry. Understanding the phase- separation for epoxy resins is vital in realizing the above-mentioned requirements. Some of the functionalities of epoxies in electronic packaging are, i) Adhesion layers; ii) Insulation layers; iii) Constituent of photo-sensitive materials; iv) Stress-relief layers (underfills).</p> <p>Adhesion between polymers and the inorganic layers is key to the reliability of a device, and typically it is improved by modulating the surface morphology. The objective of this research proposal is to understand the fundamentals of phase-separation in epoxy blends that will help us enable next-generation requirements including, i) Finer features; ii) Thinner dielectric layers; iii) Thinner conducting layers; iv) Improved performance via reduced transmission losses and, v) Reduced metal migration. A dual-pronged approach, comprising of fundamental material characteristics and thorough characterization of morphologies will be implemented in this research. We will formulate epoxy blends using polymers with varying chain length and functionality, that will be analyzed using techniques including Differential Scanning Calorimetry (DSC), Shear rheometry, Dynamic</p>

		Mechanical Analyzer (DMA), Atomic Force Microscopy (AFM) and Scanning Electron Microscope (SEM). Under the mission for “Developing Low Cost Highly Reliable and High Performing Polymeric Materials & Technologies for Packaging of Electronic Devices”, one of our objectives is to design Advanced Epoxy Composites for Future Generations of Device Packaging. This proposal focuses on understanding the Fundamentals of Phase-separation in Epoxy Blends and its impact on Structure-Property. It will also establish an understanding of composition and corresponding morphology for epoxy blends with a long-term vision to develop epoxy composites and packaging solutions for devices and sensors.
10	Maximum age	30 Years

The candidates possessing the requisite qualification and experience should apply through the ONLINE process up to **30 October 2021**. The candidates are advised to send a soft copy of the application with all relevant documents to [recruitment\\_rnd@iitj.ac.in](mailto:recruitment_rnd@iitj.ac.in) (*Please mention the advertisement number in the subject line of the email*). *No need to send a hard copy.*

### General Instructions to Applicant(s)

1.	The post(s) is purely temporary and contractual for a period of 09 Months, and extension based on satisfactory performance, but co-terminus with the duration of the project
2.	Application which is incomplete, not in prescribed format, without photograph or unsigned will be summarily rejected.
3.	Certificate in support of experience should be in proper format i.e. it should be on the organizations letter head, bear the date of issue, specific period of work, name and designation of the issuing authority along with his signature.
4.	The Institute reserves the right to: (a) conduct written/trade tests for such posts wherever if the circumstances so warrant (b) not filling any of the advertised positions (c) fill consequential vacancies arising at the time of interview from available candidates. The number of positions is thus open to change.
5.	The Institute shall verify the antecedents or documents submitted by a candidate at the time of appointment or during the tenure of the service. In case, it is detected that the documents submitted by the candidates are fake or the candidate has a clandestine antecedents/background and has suppressed the said information, then his/her services shall be terminated.
6.	No TA/DA shall be paid to the candidates for attending the interview.

7.	No correspondence will be entertained from candidates regarding interview and reasons for not being called for interview.
8.	Canvassing in any form will be a disqualification.
9.	No interim correspondence will be entertained.
10.	No need to send hard copy

Officer In-charge  
Research & Development