Prathamesh D. Raiter

EDUCATION

- **Cornell University** <div align="right">Ithaca, NY, USA</div>
  M.S. in Materials Science and Engineering   **GPA: 3.99/4.00**   <div align="right">**August 2020**</div>

- **Institute of Chemical Technology (ICT)** <div align="right">Mumbai, MH, India</div>
  B. Tech. in Chemical Engineering   **GPA: 8.28/10.0**   <div align="right">**May 2018**</div>

PUBLICATIONS

Raiter, P. D., Vidavsky, Y., & Silberstein, M. N. (2020). Can Polyelectrolyte Mechanical Properties be Directly Modulated by an Electric Field? A Molecular Dynamics Study. *Advanced Functional Materials*, 2006969.

INDUSTRIAL EXPERIENCE

- **TSMC Arizona Corporation, Phoenix, AZ**   Senior Process Engineer, *February 2021-Current*
  - Participate in the evaluation of materials and development of processes that meet specialized design and performance specifications for use in semiconductor manufacturing
  - Apply statistics process control methods to establish and sustain a robust manufacturing process
  - Install, quality and sustain manufacturing equipment to expand capacity with punctuation and quality
  - Design and execution of experiments; interpret and extract insightful results from complex data sets to optimize the manufacturing process and achieve precision control at atomic levels.

- **Jindal Films Americas LLC, LaGrange, GA**   Process Improvement Engineer, *January 2021*
  - Improve processes in terms of raw material and tool components to increase productivity and efficiency
  - Interpret manufacturing data to find out possible avenues for process improvement

- **Insight, NY, NY**   Data Engineer, *September 2020 - December 2020*
  - Built a batch-processing data pipeline and launched a web application for analysis of company reputation trends using AWS.

- **Stine Research Center, FMC, Newark, DE**   Research Internship, *June 2019 - August 2019*
  - **Naive Bayesian**: Constructed bayesian, support vector machines and random forest models for active/inactive compounds in Level 2/3 biological screens for insecticides, herbicides and fungicides and purchased new compounds based on the models.
  - **Theoretical spectra**: Developed an integrated GUI workflow in python and shell to compute theoretical UV/Vis spectra using Time-dependent density functional theory for any chemical compound present in FMC database.
  - **Usability**: Theoretical spectra computation allowed chemists to conveniently run UV/Visible spectra calculations on hypothetical compounds earlier in a project, helping them avoid synthesis of compounds not showing photostability.

- **BASF Innovation Center, Mumbai, MH**   Polymer Engineer, *May 2017 - July 2017*
  - Compared dirt pick-up resistance elongation, elasticity, tensile strength, toughness and hardness for a styrene-based architectural coating dispersion and a competitor's product. Adept in using mechanical tester and other metrology tools.
  - Characterization of styrene-based coating samples using UTM, Rheometer, Spectrophotometer and Accelerated weathering tester. Gained practical experience with product validation and polymer rheology, properties and analysis techniques
  - Assigned the tasks of assisting senior engineers in performing failure investigation and root cause analysis for polymers.

ACADEMIC PROJECTS

- **Bio-Inspired polymer membranes for resilience of electrochemical energy devices**   Master's Thesis
  Advisor: Prof. Meredith Silberstein   *September 2018 - August 2020*
  - **Modeling**: Built initial configurations of ionically charged polymers as gaussian chains with excluded volume effect
  - **Simulation**: Simulated uniaxial tensile deformation of coarse-grained and all-atom models under electric field.
  - **poly_ana**: Developed a python library to post-process and analyze uniaxial tensile deformation simulation data.
  - **Self-regulation of mechanical properties**: Analyzed influence of polymer rigidity, charge density, free ions, solvent and concentration of ionic bonds on molecular assembly and mechanical properties under electric fields
  - Installed and managed numerical libraries and application performance tools on Stampede 2 supercomputer.

- **Nanofabrication and Characterization Lab**   Graduate Lab
  Advisor: Prof. Huili Xing   *January 2020 - May 2020*
  - **Hall Effect:** Estimated Sheet Resistance, Sheet Carrier density, Electron mobility of Si wafer using 4 point measurement.
  - **Contrast Curve from Photolithography:** Developed photoresist and inspected the resist thickness using Filmetrics, which measures film thickness based on light interference. Si wafer is coated with PR, soft baked and exposed under UV.
  - **MoS_2 Thin Film Transistor:** Implemented dry transfer of MoS_2 on PDMS stamp with the pre-patterned electrode using Photolithography and devised 4-probe and output I-V characteristics (ID-VG) to obtain the ON-resistance of the FET.

- **Design, synthesis and evaluation of rivastigmine transdermal patches**   Senior Thesis
  Advisor: Prof. Shashank T. Mhaske, Prof. Pradeep R. Vavia   *September 2017 - May 2018*
  - Synthesized a 2-ethyl hexyl acrylate, acrylic acid and methyl acrylate terpolymer with free radical solution polymerization. Improved adhesive and cohesive strength for a 24-hour drug in adhesive patch by modifying reaction parameters.
  - Determined the reactivity ratios, reaction temperature and time based on a 2^3 full factorial experimental design.
  - Characterized the terpolymers with differential scanning calorimetry, GPC, FT-IR and XRD. Compared the peel Strength, adhesive transfer and assay content of the synthesized terpolymer with a popular commercial transdermal patch.
- **Synthesis and characterization of Zinc Oxide nanoparticles**   Undergraduate Summer Project
  Advisor: Prof. Ramanand N. Jagtap   *May 2017 - July 2017*
  - Synthesized Nano ZnO and correlated its size with the reaction conditions and precipitation synthesis routes.
  - Characterized the precipitated nano ZnO with particle size analyzer, XRD and UV-Vis spectroscopy.
  - XRD patterns showed that ZnO nanoparticles have hexagonal unit cell structure.

Honors and Awards

- DST-India INSPIRE Scholarship for Higher Education for being in the top 1% of class 12 board exam (2014).
- P-Pack 2017 winner, a National level *Polymers in Packaging* quiz organized by Indian Plastics Institute.

Skills

- **Analytical**: *Familiar* - MS, AFM, DSC, SEM, FT-IR, NMR, UV-Vis, HPLC, XRD, GPC, TGA, Six Sigma, SPC
- **Languages**: *Proficient* - Python, MATLAB, Shell scripting, SQL, JMP, VBA   *Familiar* - C/C++, Java, Perl
- **Fabrication**: *Familiar* - Thin film growth (MBE, CVD, PVD, PECVD), Photo-lithography, Wet etching, RIE, CMP
- **Simulation**: Molecular dynamics, Monte carlo methods, Density functional theory, Finite element analysis

Poster Presentations

- *Bayesian Classification of Level2/Level3 Actives and Theoretical Computation of UV/Vis Spectra* at Stine Research Center, FMC (Global Research and Development), Newark, DE.
- *Cost-effective Solution to Metallize Polyethylene* at Industry Defined Problem, Vortex 2016, ICT, Mumbai.

Leadership and Outreach

- **Cornell Center for Materials Research Outreach**: Science activity demonstrator at *Family Science Event*, first Saturday of each month, at Tompkins County Public Library, Ithaca, NY since September 2018.
- **Mechanics for Material Design lab**: Polymer cross-links booth instructor in 4-H Youth building at NY State Fair, August 2019.
- **Hindustan Times Clean My Mumbai**: Cleaned a two-kilometer eastern stretch of the Powai lakefront along with Bandra Cycle Club, as a part of HT Clean My Mumbai initiative.
- **In-Plant Training Coordinator, ICT 2016-2017**: Engaged students with the industries they were interested to intern at, and encouraged companies to take up captivating summer projects with students.