Clarkson University
Department of Chemical and Biomolecular Engineering
SEMINAR (Graduate Student Presentation)

"Conjugated-polymer-based photoanode for solar electrochemical water desalination in a redox flow device"

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Desalination of brackish water is a promising approach to meet the increasing freshwater need worldwide. Among the various electrochemical desalination processes, such as electrodialysis and capacitive deionization, redox flow desalination is a high-throughput, energy-efficient choice. We are interested in using sunlight as the energy source driving the electrochemical separation process. Integrating a dye-sensitized photoanode with cation and anion exchange membranes in a redox flow cell can desalinate water using light. The electrochemical cell of our study comprises flow channels for the redox electrolyte and the process streams, bounded by ion exchange membranes and electrodes. The water to be treated is passed through the device at various flow rates of practical interest, and the desalination performance is studied under the illumination of the photoanode by AM 1.5G light. The device can also be used to degrade dissolved organic matter in water. In this talk, I will discuss recent efforts in developing photoanodes based on conjugated polymers to be used for photoelectrochemical water purification.

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CAMP 175

Ramya Muralidaran is a Materials Science & Engineering Ph.D. candidate working with Prof. Sitaraman Krishnan and Prof. Taeyoung Kim in the Department of Chemical & Biomolecular Engineering. Her research is focused on designing scalable photoelectrodes for water treatment processes. Before joining Clarkson University, she graduated with a Master's degree in Chemistry from the University of Madras, India.