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September 2021

Fishing for Clean Water

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Citation of this paper:

Almusned, Baian, "Fishing for Clean Water" (2021). *Inspiring Minds – Showcasing Western’s Graduate Research, Scholarship and Creative Activity*. 9.

<https://ir.lib.uwo.ca/inspiringminds/9>

Fishing for Clean Water
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When liquid spills, paper towels are used to clean up the mess; however, cleanup methods are more complicated in the case of a nuclear spill. In North America, there are more than 100 nuclear reactors and we must be prepared for a nuclear spill.

My research focuses on using electrodialysis as a nuclear decontamination method. Electrodialysis applies principles of electrochemistry (the study of electrical and chemical interactions) and ion exchange membranes (semi-permeable polymers selective to the passage of certain ions). I apply an electric field to water containing contaminant ions. This forces the ions to move from large, contaminated bodies of water to smaller, concentrated waste volumes. Moreover, just as certain paper towels are more effective than others, membranes can be tailored to become more efficient at fishing out specific ion contaminants (i.e., radioactive contaminants). This research ensures effective cleanup methods will be available in case of a nuclear spill.