

CHEMISTRY - RESEARCH SEMINAR

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204 Armes

Understanding environmental reactions of PFAS and other contaminants for a more sustainable world

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Harmful chemical contaminants are found in nearly every corner of the environment, affecting humans, wildlife, and drinking water. Ideally, all human-made chemicals would degrade safely after use, but unfortunately, many either persist themselves or transform into persistent and toxic products. Understanding environmental reactions is required to assess the lifecycle impact of a chemical and to determine why certain chemicals degrade while others do not. In this talk, I will focus on our efforts to identify reactive sources of trifluoroacetic acid (TFA) in the environment, a contaminant that is extremely persistent and increasing in environmental concentration. We are investigating how aquatic photochemistry reactions of aryl-CF₃ contaminants, including pesticides and pharmaceuticals, can form TFA instead of complete mineralization to fluoride. Mechanistic insights were gained by testing a scope of aryl-CF₃ with different substituents, and the use of stable isotope labelling with high resolution mass spectrometry to track transformation product formation. I will also discuss our work understanding the fate of rubber additives and oil constituents in aquatic ecosystems. Together, this work aims to minimize exposure to harmful chemicals and inform *design for degradation* for a healthier, more sustainable society.

