



Optimisation of Precursor Synthesis for PFAS-Free, Bio-Based Membranes in Next-Generation Fuel Cells and Electrolysers

Description:

ionida is pioneering the development of advanced membranes for fuel cell and electrolyser applications. Our membranes are PFAS-free, bio-based, and designed to overcome the limitations of current materials by enabling operation at higher temperatures and lower humidities. The membrane precursors are synthesised through a straightforward reaction from a diverse library of building blocks, allowing for hundreds of combinations and tailored material properties. Systematic screening of these precursors supports the optimisation and customisation of membranes for specific use cases. As we scale up manufacturing, ensuring reproducibility in precursor synthesis is essential for consistent batch quality.

Project Objectives:

This project aims to optimise the synthesis of precursor molecules and investigate the relationship between precursor purity and membrane performance.

Main Tasks:

- Synthesis of a small library of Ionida's patented chemical precursors under varied reaction conditions
- Monitoring reactions and evaluating product purity using thin layer chromatography (TLC), nuclear magnetic resonance spectroscopy (NMR), Fourier transform infrared spectroscopy (FTIR), and mass spectrometry
- Preparation of membranes using ionida's facilities
- Testing basic membrane properties and correlating performance with structural characteristics through conductivity and nanostructural analysis (external evaluation)

We offer:

- Hands-on experience in synthetic chemistry and materials science
- Access to state-of-the-art laboratory facilities
- Opportunity to contribute to sustainable energy technologies
- A monthly stipend for up to 6 months

Requirements:

- Background in chemistry, materials science, or a related field
- Experience with organic synthesis and analytical techniques is an advantage

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