

# **Synthesis and Testing of Titanium Phosphate Membranes made using Sol-gel Technology for Use in Fuel Cells**

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## **Abstract**

Fuel cells are part of the long term solution to alternative forms of energy. They offer clean solutions to energy production and utilization but further research is required to improve efficiency. In this work, the viability of using titanium phosphates produced from sol-gel synthesis as a proton conduction mechanism in a solid acid fuel cell was tested. This was a desirable goal as titanium phosphates would have a higher operating temperature than current Nafion proton exchange membranes, solving many problems and improving theoretical yield. However, it was found that the titanium phosphates produced through sol-gel synthesis were too porous to use in a fuel cell system, and as such massive gas crossover was experienced and no voltage was produced.