

Abstract Submitted
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Plasma Assisted LCF Perovskite Ion Transport Membrane Processing of Methane.¹ JULIO OCANA ORTIZ, CHIGOZIE CHINAKWE, REECE FREDERICK, RAJAGOPALAN RANGANATHAN, MRUTHUNJAYA UDDI, None — Ion Transport Membranes (ITM) are ceramic based materials that allow the permeation of ions, commonly oxygen, through the structure at high temperatures. ITMs can be utilized in oxy- combustion, molecular separation of hydrogen reactors, and is effective in Carbon Capture and Sequestration (CCS) methods. Nevertheless, such high operating temperatures are not completely ideal, mainly due to its environmental impact and high energy input. In this project, it is aimed to reduce the temperature required to enhance oxy combustion reactions by applying a low-temperature plasma-catalysis to a LaCaFeO₃ (LCF) perovskite ITM. The experimental reactor is placed inside a ceramic casted furnace where the reaction takes place on each side of the membrane, monitoring the products on the sweep side using a Quad-Pole Mass Spectrometer (QPMS). Future works aim to use solar energy to power the reactor.

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