Abstract Submitted
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Plasma Assisted LCF Perovskite Ion Transport Membrane Processing of Methane.[1] CHIGOZIE CHINAKWE, JULIO OCANA-ORTIZ, None, REECE FREDERICK, R. RANGANATHAN, DR. MRUTHUNJAYA UDDI TEAM — Ion transport membranes (ITMs) have played a key role in the study of processing and converting natural gases. The membranes are composed of ceramic-based materials and allow the permeation of ions at temperatures ranging from 700° to 950°. Due to low energy conversion efficiency, the high temperatures related to the membrane separation system are inefficient for industry use. The experiment at hand focuses on treating LaCaFeO (LCF) perovskite ITM with low-temperature plasma in order to lower the activation energy and heighten the performance of the ITM. The reactor was controlled in a two-inch diameter quartz tube placed inside an alumina ceramic furnace. Metal inlets sealed the opening ends of the quartz tube and allowed the insertion of the LCF perovskite ITM, feedstock gas(air), sweep gas or reactive gas(CH4), and plasma electrode (kanthal wire). To generate the plasma, the electrodes were connected to a 110.V PVM/DDR plasma drive. The study was inconclusive due to the damaging of the LaCaFeO3 perovskite ITM. The bulk of the ITM, as well as the adhesive used to attach the membrane, assisted in the ITM rupturing. Moving forward we hope to find a solution to these problems in order to run the reactor and receive data.

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