

Abstract Submitted
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Glow-Discharge Production of Oxygen from the Martian Atmosphere CALEB HUGHES, RONALD OUTLAW, None — One of the most crucial aspects of any mission to Mars is a continual supply of oxygen for astronaut respiration on site. The most popular approach to this problem favors in-situ oxygen production on Mars, utilizing the CO_2 Martian atmosphere. However, this requires a large energy budget. NASA's current plans for Mars include sending a system called MOXIE, which produces oxygen through solid oxide electrolysis at high temperatures. An alternative approach utilizes the 6 Torr Martian atmosphere to provide a continual source of oxygen by breaking down the molecule into CO and O using a glow-discharge. After dissociation, a thin film Ag membrane uniquely permeates the atomic oxygen which then recombines to O_2 on the downstream side, where it is subsequently stored. By taking advantage of recent advances in thin film technology to reduce the thickness of the film to many orders of magnitude less than used in the initial study, a corresponding increase in O_2 flux can be realized. The Ag thin film requires the support of a porous ceramic substructure. With this system, it is shown that this method produces a viable energy efficient alternative to MOXIE.

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None

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