Contribution ID: **41** Type: **not specified**

Design and modeling a plasma reactor for the production of O2 from the conversion of CO2

Tuesday 28 January 2025 11:24 (12 minutes)

The design and modeling of a plasma reactor for the conversion of CO_2 into O_2 offers a novel and sustainable approach to addressing the increasing levels of carbon dioxide in the Earth's atmosphere. By utilizing plasma-assisted processes and oxygen-conducting membranes, the project investigates the potential to split CO_2 into its base components, enabling the production of a continuous oxygen flow. This approach directly addresses the urgent need to reduce greenhouse gas concentrations and to mitigate their contribution to global warming.

In addition to its terrestrial applications, the proposed technology has significant implications for space exploration. Mars, with an atmosphere composed of over 95% CO_2, provides an ideal context for deploying this method to generate oxygen in terraforming efforts.

The project integrates multiple phases, including reactor modeling and simulation, the development and optimization of 3 types of oxygen-conducting membranes, and experimental validation through proof-of-concept oxygen flux measurements.

These efforts aim to refine the reactor design and optimize its efficiency, contributing to global sustainability goals by measuring pure oxygen fluxes.

Primary author: SANTOS, Inês (Instituto Superior Técnico)

Presenter: SANTOS, Inês (Instituto Superior Técnico)