Development of cathodes based on aerogels for electrochemical reduction of CO_2 at high pressure

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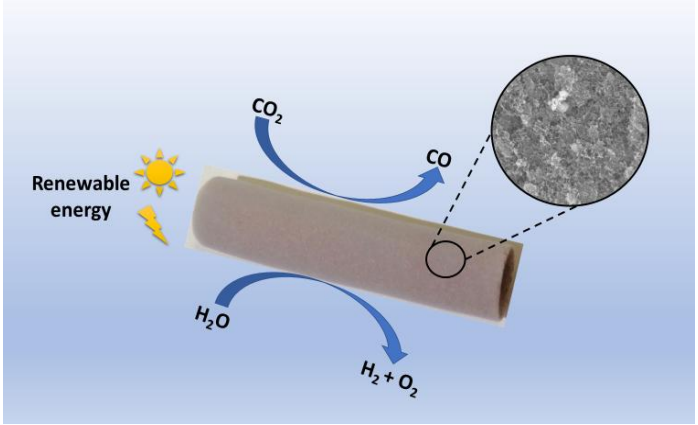
Electrochemical CO_2 reduction powered by renewable technologies to produce fuels and chemical building blocks is a research technology with the potential to close the anthropogenic carbon cycle [1]. Despite being intensively researched, it still presents several technological obstacles, namely, low energy efficiencies, low CO_2 conversions and poor electrode stability.

In previous works the development of a process to produce syngas ($CO+H_2$) that works at pressures higher than atmospheric pressure was reported. The results showed that the use of pressure as process intensifying parameter to circumvent the aforementioned challenges, in particular low conversions and low energy efficiencies seems promising [2-3]. Syngas produced by this green process can be used to synthetize an enormous variety of chemicals in a sustainable way.

This work reports the development of materials based on aerogels to be used as cathodes in Electrochemical CO_2 reduction. Compared to powdered catalytic cathodes, these materials present the advantage of promoting better electric contacts, together with efficient mass and heat transfer, low pressure drop, and high surface area. Activity and faradaic efficiencies of the prepared catalytic cathodes are correlated with the morphologies of these materials determined by SEM and BET surface areas.



Acknowledgement

This work was performed under the project "SunStorage - Harvesting and storage of solar energy", with reference POCI-01-0145-FEDER-016387, funded by European Regional Development Fund (ERDF), through COMPETE 2020 - Operational Programme for Competitiveness and Internationalisation (OPCI), and by national funds, through FCT - Fundação para a Ciência e a Tecnologia I.P.

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