



# FABRICATION OF SUPPORTED OXIGEN MEMBRANE FOR OCM PROCESS

N. Badiola<sup>1,2,3</sup>, E. Fernandez<sup>2</sup>, F. Gallucci<sup>1</sup>, P.L. Arias Ergueta<sup>3</sup>, M. Van Sint Annaland<sup>1</sup>, D.A. Pacheco Tanaka<sup>2</sup>

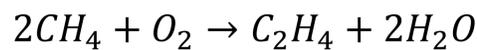
1 Chemical Process Intensification, Chemical Engineering and Chemistry, Eindhoven University of Technology, The Netherlands  
2 TECNALIA, Energy and Environment Division, Spain  
3 UPV-EHU, University of Basque Country, Spain



nerea.badiola@tecnalia.com  
F.Gallucci@tue.nl

## Introduction

The MEMERE project aims at developing new O<sub>2</sub> selective (supported) CO<sub>2</sub> tolerant membranes for high temperature air separation and integrating these membranes in a novel membrane reactor for direct conversion of methane to C<sub>2</sub>'s through OCM (Oxidative Coupling of Methane) process.



In addition to the integrated air separation, also the yield of the OCM system can be increased by operating at low O<sub>2</sub> partial pressures via distributive feeding of O<sub>2</sub> through the inorganic high-temperature membranes.

## Experimental and results

- Membrane preparation using a dip coating technique has been done.
- Different concentration solutions has been prepared in order to select the most suitable materials (with comparable thermo-chemical expansion coefficient).

### Membrane with two different configuration

#### Perovskite: BSCF

Disadvantage:

- CO<sub>2</sub> poisoning, rendering the membrane no longer selective.

Advantage:

- High ion-conductivity and electron conductivity



#### Fluorite: CGO

Disadvantage:

- High ion conductivity but no electron conductivity.

Advantage:

- Not CO<sub>2</sub> poisoning

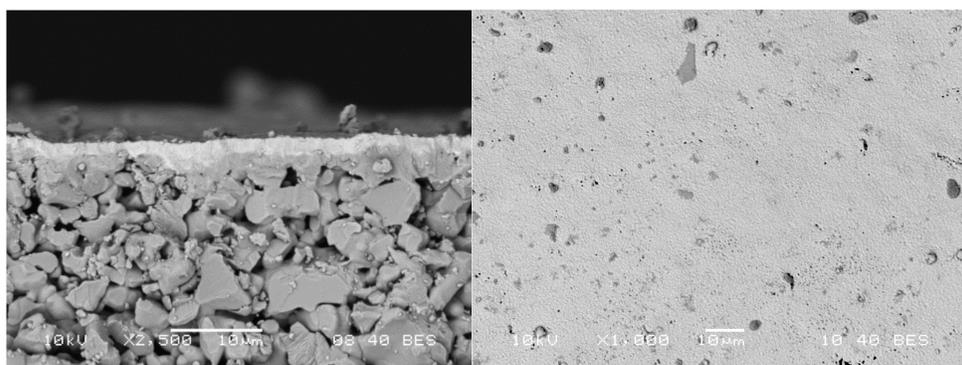
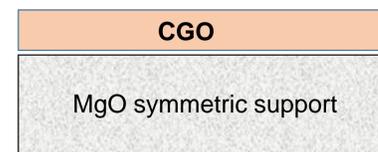


Fig 1. SEM images of CGO coated MgO tubular support cross section (left) and surface (right)

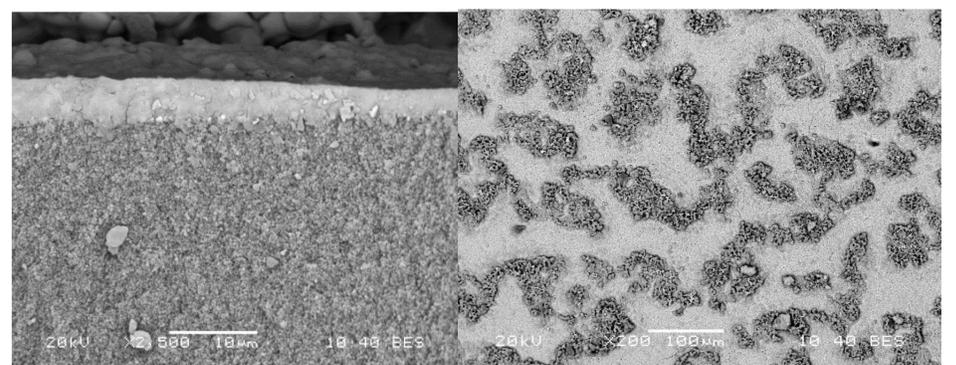


Fig 2. SEM images of BSCF coated Al<sub>2</sub>O<sub>3</sub> tubular support membrane cross section (left) and surface (right)

## Conclusions

- A dense thick layer of CGO has been obtained, but there are defect on the deposited layer.
- There is a segregation problem in the BSCF deposited layer.

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