# SYNTHESIS OF Ni/$LaAlO_3$ – PEROVSKITE CATALYSTS VIA A MOF PRECURSOR FOR THE DRY REFORMING OF METHANE

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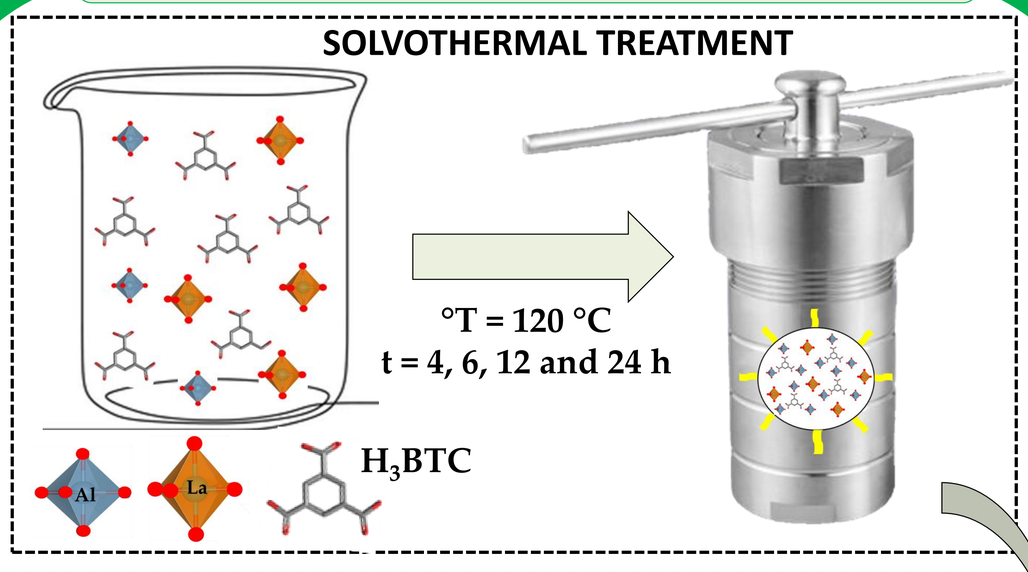
## ABSTRACT

A simple, low-temperature, and versatile strategy has been developed for the first time to prepare highly porous pure perovskite ($LaAlO_3$) as a catalytic support using a Metal Organic Gel precursor. The perovskite obtained after solvothermal treatment at 120 °C for 12 h and calcination at 750 °C maintained the mesoporous characteristics of the MOF precursor, with a small particle size due to the decrease in crystallization temperature. These properties in the support allowed a good dispersion of the active Ni sites, low reducibility, and a strong interaction between them and the support.

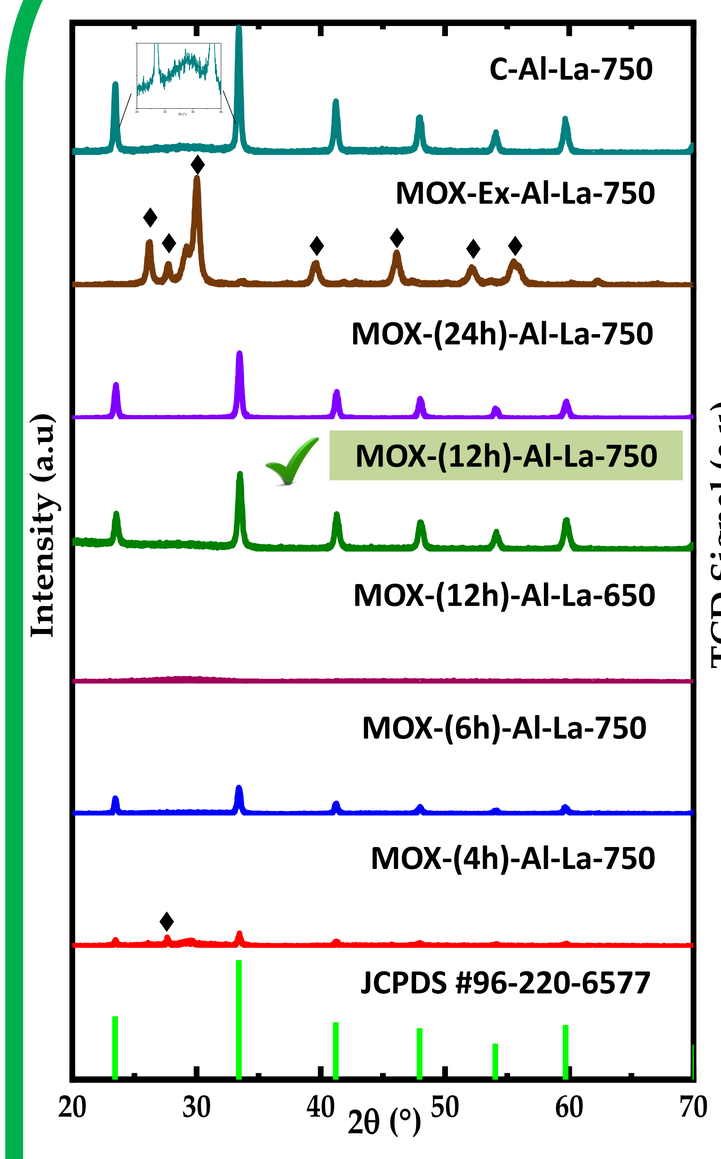
The best Ni-modified perovskite (MOX-(12h)-$LaAlO_3$-750-Ni) has shown efficient catalytic performance in the conversion of greenhouse gases ($CO_2$ and $CH_4$) into synthesis gases (CO and $H_2$).

## METHODOLOGY

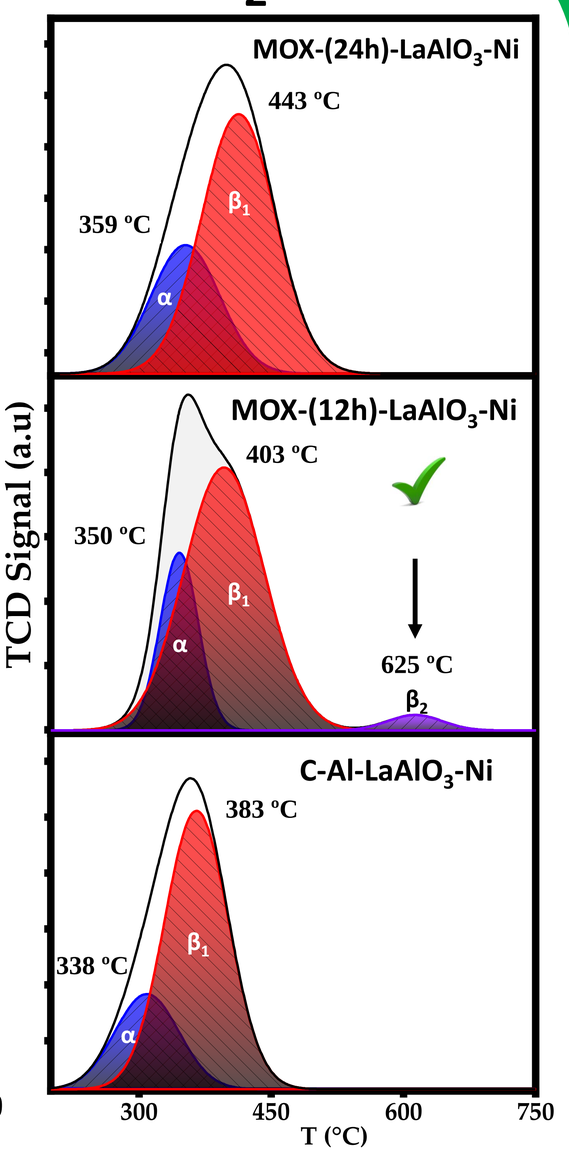



## RESULTS

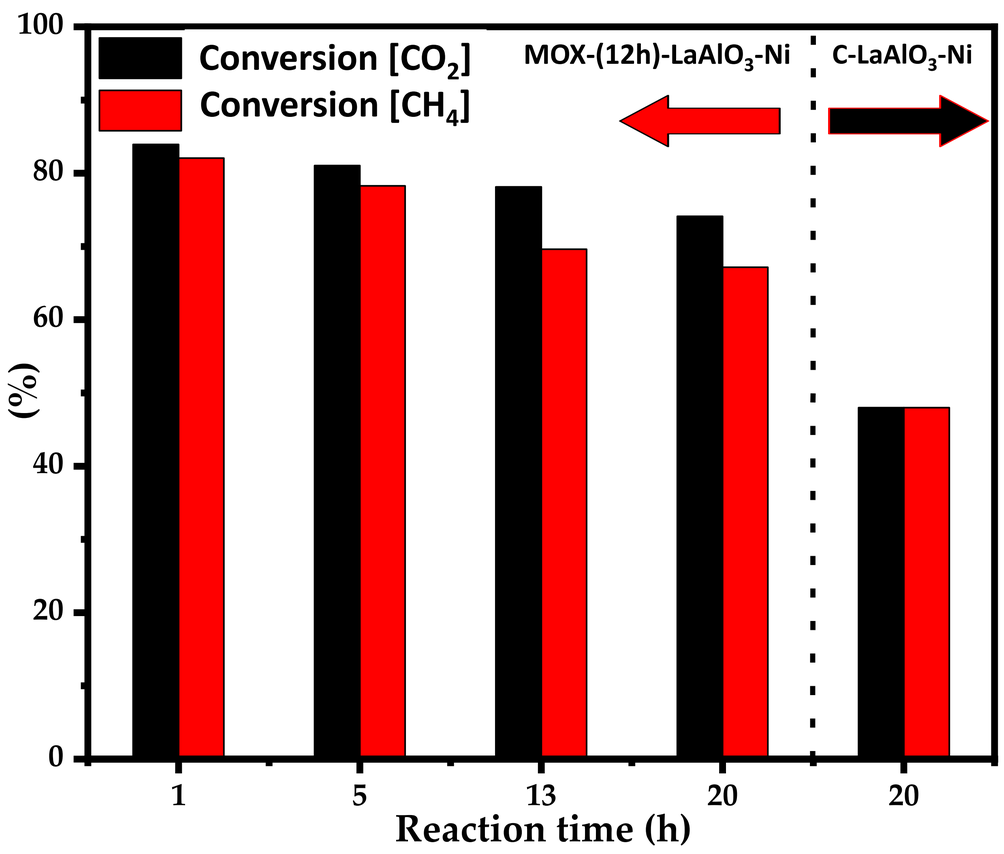
### XRD



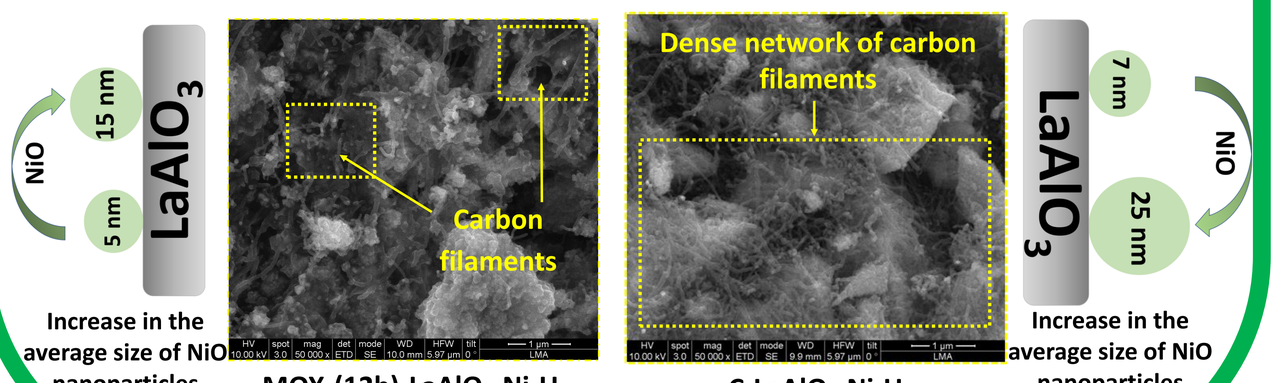

### $H_2$-TPR




### CATALYTIC PERFORMANCE




### SEM IMAGES OF CATALYSTS USED




## CONCLUSIONS AND ACKNOWLEDGEMENTS

* The catalytic support obtained after solvothermal treatment at 120 °C for 12 h maintains the mesoporous characteristics of the MOG precursor with a high $S_{BET}$ (3 times higher than the reference material) and exhibits the best catalytic performance in DRM after modification with Ni. The resulting MOX-(12h)-$LaAlO_3$-750-Ni catalyst gave a $CH_4$ average conversion of 75% and $CO_2$ average conversion of 80% after 20 h of reaction.The enhanced catalytic behavior can be attributed to improved textural properties, the presence of specific Ni species, strong oxide/support interaction of NiO species, and resistance to the formation of dense carbon filaments.

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