## Role of the thermal treatment on a porous Ce-Zr-Cu oxide system with layered morphology

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## **1. Introduction**

The preparation of micro/nanocomposite structures with controlled and highly specific morphology is of particular interest to chemists and material scientists not only for their role in better understanding the concept of selfassembly, but also for their great potential applications, such as in heterogeneous catalysis. Recent studies showed that the performances of ceria-related materials strongly depend on the morphologies and crystallographic orientations of the nanometer-sized ceria [1, 2].

## 2. Results and Discussion

Herein, a porous Ce-Zr-Cu mixed oxide was prepared by a very slow coprecipitation method and heat-treated at different temperatures (from 350°C to  $650^{\circ}$ C), with the aim to determine the effect of the thermal treatment on characterized The resulting materials the system. were bv Thermogravimetric Analysis (TGA), DRIFT-IR spectroscopy, X-ray Powder Diffraction (XRPD), N<sub>2</sub> physisorption at -196°C, Temperature-Programmed Reduction (H<sub>2</sub>-TPR) and Electron Microscopies (SEM and TEM). The samples showed a desert rose-like structure, made up of long (> 10 µm) and thin (about 2 nm) petals with quite homogeneous size and morphology and maintained its morphology, composed by micro-sheets, even after prolonged thermal treatment at 650°C.

## **3. References**

[1] L.S. Zhong, J.S. Hu, A.M. Cao, Q. Liu, W.G. Song and L.J. Wan, Chem. Mater. 19 (2007), p. 1648.

[2] M. Lenarda, E. Moretti, L. Storaro, A. Talon, R. Moreno-Tost, E. Rodríguez-Castellón, A. Jiménez-López, Catal. Letters 129 (2009) 323.