

Novel OMC by nanocasting strategy for hydrogen adsorption.

Juliana M. Juárez*, Marcos B. Gómez Costa, Oscar A. Anunziata.

Centro de Investigación en Nanociencia y Nanotecnología (NANOTEC). Facultad Regional Córdoba, Universidad Tecnológica Nacional, Maestro López y Cruz Roja Argentina, 5016, Córdoba, Argentina.

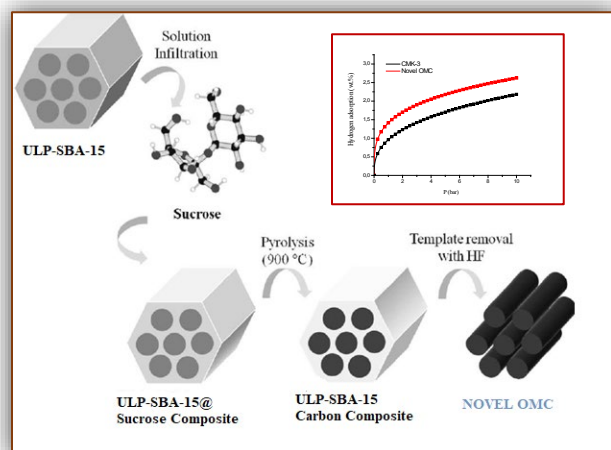
*E-mail: jjuares@frc.utn.edu.ar

Presenting Author' Biography



Juliana María Juárez had received the B.E. and Ph.D. degrees in Chemical Engineering from Universidad Tecnológica Nacional, Facultad Regional Córdoba, Argentina, in 2005 and 2015, respectively. In the research career, he became doctoral fellow, postdoctoral fellow, assistant researcher and now an adjunct researcher of the Consejo Nacional de Investigaciones Científicas y Técnicas (CONICET), Argentina. Dra. Juliana Juárez is a member of Centro de Investigación en Nanociencia y Nanotecnología (NANOTEC), Facultad Regional Córdoba, Universidad Tecnológica Nacional – FRC. Her current research interests include hydrogen storage on nanoporous materials, conducting polymers and drug controlled release systems.

Graphical Abstract



A novel OMC material was synthesized by nanocasting strategy using a ultra large pore SBA-15. The synthesized material is promising for hydrogen uptake by means of weak bonding (physisorption).

Abstract

A silica material of the SBA-15 type with ultra-large pores (20 nm) was synthesized by the sol-gel method. This silica mesoporous material was impregnated twice consecutively with an acid solution of sucrose and the organic material carbonised inside the mesopores. After dissolution of the silica framework, an ordered mesoporous carbon (OMC) with regular mesopores with mean diameter in the range of 6 nm. The specific surface area of the carbon was increased by increasing filling of the silica pores with the organic material, from 350 m²/g to 950 m²/g.

The novel OMC material was successfully synthesized and characterized by X-ray diffraction, textural properties, SEM and transmission electron microscopy analyses.

This novel OMC improved significantly the H₂ storage behaviour (2.62 wt% at 77 K and 10 bar) compared with a similar CMK-3 (2.18 wt% at 77K and 10 bar). The synthesized material is promising for hydrogen uptake by means of weak bonding (physisorption).

Keywords: OMC; Nanocasting; Hydrogen, Energy.

Acknowledgements

JMJ, MGC and OAA, CONICET researchers, UTN-FRC. The authors thank FONCyT. PICT 2017-2021 1740 and PICT 2016-1135.

Advanced Nanomaterials CONGRESS

24 - 27 October 2021 | Central European Summer Time (CEST)

Online
LIVE



21 Sep 2021

CONGRESS INVITATION LETTER

To,
Dr. Juliana Juarez,
Centro de Investigación en Nanociencia y Nanotecnología (NANOTEC). Facultad Regional Córdoba, Universidad Tecnológica
Nacional, Argentina
E-mail: julijuarez@gmail.com

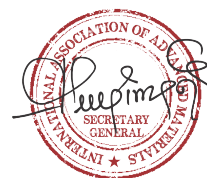
Dear **Dr. Juarez,**

The Advanced Nanomaterials Congress (www.advancedmaterialscongress.org/nano) is an annual assembly organized by the International Association of Advanced Materials in Stockholm, Sweden during 24-27 October 2021 with Online LIVE participation setup. This congress intends to provide an opportunity to promote intensive discussions and collaborations among participants to enhance and widen the knowledge of nanomaterials science, engineering & technology and to surge innovation and responsiveness for the technological needs towards advancements of nanotechnology to sustainable and greener world.

We are pleased to accept your abstract and invite you to join us in this important international event to contribute your own expertise and present **Poster Presentation** on your submitted work entitled, 'Novel OMC by nanocasting strategy for hydrogen adsorption.'. Your abstract is also going to be published in the Congress Proceedings Book with ISBN number. All attendees must register for the congress and pay the appropriate registration fee on due date. Organizer does not provide any financial support to attend this congress.

Thank you for your interest in participating in this assembly. We look forward to welcoming you in the Congress.

Yours sincerely



(**Dr. Ashutosh Tiwari**)
Secretary General
International Association of Advanced Materials
E-mail: secretarygeneral@iaamonline.org
URL: www.iaamonline.org/secretary-general