Polymer aerogels based on 2-Hydroxyethyl methacrylate

Petronela Horlescu[1*], Corneliu S. Stan[1], Marcel Popa[1,2], Margaux Descamd[3] and Patrick Martin[3]

[1] *Faculty of Chemical Engineering and Environmental Protection, Gh. Asachi Technical University,73 D. Mangeron, 700050, Iasi, Romania*
[2] *The Academy of Romanian Scientists, Splaiul Independentei no. 54, sector 5, 050094 Bucharest, Romania*
[3] *Université d'Artois, IUT Béthune, Département Chimie, CS20819, 62408 Béthune, France*
[*] *elahorlescu@tuiasi.ro*

In this work highly porous polymer aerogels were prepared using 2-Hydroxyethyl methacrylate (HEMA and N,N'-methylene bisacrylamide. In the first step HEMA monomer and the crosslinker are dissolved in water followed by the addition of a certain photoinitiator . The preparation path require an intermediary stage for obtaining a polymer cryogel which undergoes at 260K in the presence of 320 nm UV radiation as excitation source for the photoinitiated polymerization. The resulted cryogel is allowed to warm up to room temperature and then is dipped in absolute ethanol. This solvent exchange operation is repeated for 3 times till the complete removal of water trapped in the porous gel. After ageing in ethanol, the alcogel was dried under supercritical regime by exchanging the ethanol with liquid carbon dioxide followed by supercritical evaporation.

The resulted polymer aerogel (Figure 1) has an interconnected pore structure with pore size in the hundreds nanometer range. Structural investigation was performed using FTIR while the morphology of the resulted polymer aerogel was investigated using SEM and BET analysis. Thermal behavior was evaluated through thermal analysis. The newly prepared polymer aerogel could be potentially interesting for applications ranging from controlled drug release matrix to high performance thermal insulating materials or water purification.

Figure 1: Prepared cylindrical shaped polymer aerogel

Acknowledgements

This work was supported by a grant of the Romanian National Authority for Scientific Research, CNCS–UEFISCDI, Project Number PN-II-ID-PCE-2011-3-0708.

References

[1] L. A. Capadona, M. A. B. Meador, A. Alunni, E. F. Fabrizio, P. Vassilaras, N. Leventis, *Polymer* 47(16), pp. 5754–5761 (2006).

[2] C. S. Stan, N. Marcotte, M. Popa, M. Secula, *J. of Sol-Gel Science and Technology* 69, pp. 207–213 (2014).

[3] P. C. Thapliyal, K. Singh, *Hindawi - Journal of Materials*, Vol. 2014, Article ID 127049 (2014).

7TH INTERNATIONAL MEETING ON ATOMIC AND MOLECULAR PHYSICS AND CHEMISTRY

IMAMPC 2016

Le Havre, Normandy, June 27-30

ASTROCHEMISTRY COLLISIONAL ENERGY TRANSFERS
COLD ATOMS AND MOLECULES
MACROMOLECULES CLUSTERS
ELECTRONIC STRUCTURE SPECTROSCOPY OF MOLECULES
CHEMICAL REACTIVITY IN THE GAS PHASE
AND AT THE GAS/SURFACE INTERFACE

Organizing committee

François Lique LOMC - Le Havre
Fabien Dumouchel LOMC - Le Havre
Carole Le Guen LOMC - Le Havre
Kyle Walker LOMC - Le Havre
Julie Douady CIMAP - Caen
Alicja Domaracka CIMAP - Caen
Christiane Malot CIMAP - Caen
Patrick Rousseau CIMAP - Caen
Eric Giglio CIMAP - Caen
David Zanuttini GPM - Rouen

Scientific committee

Tomás González Lezana CSIC - Madrid
Paola Bolognesi CNR/ISM - Rome
Alexandre Faure Observatoire de Grenoble
Rita Prosmiti CSIC - Madrid
Sébastien Le Picard IPR - Rennes
Jean Christophe Tremblay Freie Universitat - Berlin
Sarandis Marinakis Queen University - Londres
Carla Coppola Università degli studi di Bari Aldo Moro
Sebastien van der Meerakker Radboud University - Nimègue
Alicja Domaracka CIMAP - Caen

http://imampc2016.sciencesconf.org