

## NEW SYNTHESIS OF SBA-3 MESOPOROUS MATERIAL USING SILICA GEL AS SILICA SOURCE

María L. Martínez, María V. Ponte, Andrea R. Beltramone and Oscar A. Anunziata.  
NANOTEC (Centro de Investigación en Nanociencia y Nanotecnología) Facultad Regional Córdoba-  
Universidad Tecnológica Nacional, Córdoba, Argentina.

One of the main areas of interest in materials chemistry is the synthesis of mesoporous molecular sieves with highly controllable morphologies for the purpose of providing catalytic, separation, and adsorption applications to industry. The main drawback is that the expensive source of silicon as alkoxide ( $\text{Si}(\text{OEt})_4$  or  $\text{Si}(\text{OMe})_4$ ) prevents any application where large amounts of materials are required [1–2].

Ordered mesoporous silica material has been synthesized successfully by using cetyltrimethylammonium bromide (CTAB) as a structure-directing agent and inexpensive silica gel dissolved in a solution of sodium hydroxide, as the silica source without any additives. The synthesis is performed at room temperature in the presence of hydrochloric acid. The analysis of X ray diffraction shows that the resultant mesoporous materials possess an hexagonal mesostructure. We studied the effect of the initial NaOH concentration and the synthesis time on the structure and morphology of mesoporous silica SBA-3. The crystal size and structural order of the samples were found to be greatly affected by NaOH variations. The results suggest that, if the NaOH concentration increases reaching values higher than 1 M, the SBA-3 is not generated, since there is no precipitation or formation of silica gel in the reaction, appearing the corresponding disordered or amorphous silica. Whereas, when time increase from 45 min to 120 min, with molar concentration of NaOH of 0.75, the material obtained show a hexagonal mesostructure observed in the XRD pattern.

Keywords: Mesoporous materials, SBA-3; silica gel

### References:

- [1] Key role of sodium silicate modulus in synthesis of mesoporous silica SBA-15 rods with controllable lengths and diameters. Yi Ding, Guangfu Yin, Xiaoming Liao, Zhongbin Huang, Xianchun Chen, Yadong Yao. *Materials Letters* 75 (2012) 45–47.
- [2] Synthesis of highly ordered and hydrothermally stable mesoporous materials using sodium silicate as a precursor. Dahai Pan, Lei Tan, Kun Qian, Liang Zhou, Yu Fan, Chengzhong Yu, Xiaojun Bao. *Materials Letters* 64 (2010) 1543–1545

Presenting author's email: [mmartinez@scdt.frc.utn.edu.ar](mailto:mmartinez@scdt.frc.utn.edu.ar), [mponte@scdt.frc.utn.edu.ar](mailto:mponte@scdt.frc.utn.edu.ar),  
[abeltramone@scdt.frc.utn.edu.ar](mailto:abeltramone@scdt.frc.utn.edu.ar), [oanunziata@scdt.frc.utn.edu.ar](mailto: oanunziata@scdt.frc.utn.edu.ar)