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ABSTRACT BOOK

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SIMP-SGI-SOGEI 2019

Il tempo del pianeta Terra
e il tempo dell'uomo:
Le geoscienze fra passato e futuro



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Thermal stability of hybrid organic-inorganic metallosilicates

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Eni Carbon Silicates (ECSs) form a new class of crystalline hybrid organic-inorganic metallosilicates synthesized using bridged silsesquioxanes $(R'O)_3Si-R-Si(OR')_3$ (R=phenylene, biphenyl, naphthyl; R'=methyl, ethyl) as the sole silicon source and $NaAlO_2$ or $Ga(i-PrO)_3$ as sources of trivalent element (e.g., Millini & Bellussi, 2016 and references ins.). Several ECS phases have been synthesized so far by slightly varying the composition of the reaction mixture; the structural characterization of many of them evidenced that all the hybrid phases known so far are invariably composed of a regular stacking of covalently bonded organic and inorganic layers, which alternate along the stacking direction (Bellussi et al., 2012a; Bellussi et al., 2012b; Bellettato et al., 2014). The interest towards this class of materials arises from the possibility of combining advantages of both organic (functionality and flexibility) and inorganic (thermal, mechanical and structural stability) components, thus making ECSs attractive for applications in different fields. Based on the wide range of applications, to investigate ECSs thermal behaviour and characterize their structure under operating conditions is fundamental to predict and optimize the working environment. With this purpose, different ECS samples (i.e., ECS-17, Ga-ECS-17 and ECS-14) were analysed through temperature-resolved powder X-ray diffraction. Data were collected at the ID22 Beamline of ESRF from Room Temperature to 590 °C (heating rate = 5 °C/min). Rietveld refinements of diffraction patterns were carried out using the GSAS software package (Larson & von Dreele, 1994). The experimental approach used gave information about the framework flexibility, monitoring framework geometry variations and studying the rearrangement of alkali metal ions and their interactions with the framework oxygen atoms upon heating; moreover, desorption kinetics in real-time conditions were determined, highlighting the influence of dehydration processes on the structural stability of ECSs phases. These informations are crucial to improve efficiency of ECSs as catalysts as well as for applications such as gas-sensor devices, wavelength converters, and antenna systems (Tani et al., 2009), where they are employed as donor.

- Bellettato M., Bonoldi L., Cruciani G., Flego C., Guidetti S., Millini R., Montanari E., Parker Jr. W.O. & Zanardi S. (2014) - Flexible Structure of a Thermally Stable Hybrid Aluminosilicate Built with Only the Three-Ring Unit. *J. Phys. Chem., C* 118, 7458-7467.
- Bellussi G., Montanari E., Di Paola E., Millini R., Carati A., Rizzo C., Parker W.O.Jr., Gemmi M., Mugnaioli E., Kolb U., Zanardi S. (2012a) - ECS-3: A Crystalline Hybrid Organic-Inorganic Aluminosilicate with Open Porosity. *Angew. Chem. Int. Ed.*, 51, 666-669.
- Bellussi G., Millini R., Montanari E., Carati A., Rizzo C., Parker W.O., Cruciani G., De Angelis A., Bonoldi L. & Zanardi S. (2012b) - A highly crystalline microporous hybrid organic-inorganic aluminosilicate resembling the AFI-type zeolite. *Chem. Commun.*, 48, 7356-7358.
- Larson A.C. & Von Dreele R.B. (1994) - General structure analysis system, report LAUR 86-748. Los Alamos National Laboratory Report LAUR, 86.
- Millini R. & Bellussi G. (2016) - Hybrid organic-inorganic zeolites: status and perspectives. *Catal. Sci. Technol.*, 6, 2502-2527.
- Tani T., Mizoshita N. & Inagaki S. (2009) - Luminescent periodic mesoporous organosilicas. *J. Mater. Chem.*, 19, 4451-4456.

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