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ABSTRACT BOOK

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A SUSTAINABLE FUTURE

UNIVERSITÀ DI TORINO

S17. Microporous and layered minerals: properties and applications for a sustainable future

P-induced crystal-fluid interactions in 6-membered ring zeolites with EAB topology

Gatta G.D.*[1], Battiston T.[1], Comboni D.[2], Pagliaro F.[1], Lotti P.[1], Migliori M.[3], Giordano G.[3] & Ferrarelli G.[4]

[1] Dipartimento di Scienze della Terra "A. Desio", Università di Milano. [2] ESRF, Grenoble (France). [3] Laboratory Chemical Engineering and Catalysis for Sustainable Processes, Università della Calabria, Rende (CS). [4] Dipartimento di Scienze Chimiche, Biologiche, Farmaceutiche ed Ambientali, Università di Messina.

Corresponding author e-mail: diego.gatta@unimi.it

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P-induced intrusion of molecules (or solvated ions) into the structural nano-cavities of a microporous material, e.g., a zeolite, opened a new route to promote a mass transfer from fluids to structurally-incorporated molecules. A full understanding of this phenomenon in natural or synthetic zeolites might expand the number of their utilizations, e.g., in tailoring functional materials or improving catalytic abilities in industrial processes, or for a description of zeolite-fluids interaction in early subduction zones (e.g., Gatta et al., 2018; Comboni et al., 2020).

In this study, synthesis of EAB zeolite samples has been performed following the Aiello-Barrer protocol (Aiello & Barrer, 1970), and then treated in order to obtain the Na- and K-form. Then, we have investigated the high-*P* behaviour, promoting crystal-fluid interaction, of the 2 EAB zeolites by in-situ single-crystal synchrotron X-ray diffraction, using a diamond anvil cell (DAC), at the ID15B beamline of ESRF (Grenoble, France). Distilled H_2O, ethanol, methanol and the nominally non-penetrating silicon-oil as hydrostatic pressure transmitting fluids. Compression in non-penetrating silicone oil gives rise to a compressional behaviour without any crystal-fluid interaction, providing a reference for the compressional pattern obtained in nominally penetrating fluids. The results of this research will allow 1) to understand the role played by the pre-existing extraframework population (cations+H_2O molecules) on the adsorption of penetrating molecules, and 2) assess the magnitude of the adsorption by comparing the compressibility of these synthetic microporous compounds.

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