

10th Conference of the Federation of the European Zeolite Associations



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NAPLES - ITALY
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inorganic silica. Among wastes from industrial activities involving aluminium, materials from bauxite processing (red mud - RM) and aluminium alloy production (ARG) represent the most abundant. In this study, mixtures of Italian RHA+RM or RHA+ARG were used as sources of silica and alumina for the synthesis of potassium zeolite. The results show the effect of the chemical composition of the two industrial wastes on the synthesis of merlinoite rather than chabazite. Using waste mixtures to form useful minerals offers the opportunity to improve the amount of waste to be recycled.

ID 74: K-ZEOLITE FORMATION FROM UNCONVENTIONAL HIGH-SILICA (OBSIDIAN) OR HIGH-ALUMINA (BAUXITE) SOURCE

In this paper, obsidian and bauxite were used to form zeolites by KOH prefusion followed by conventional hydrothermal process or unconventional vapour phase crystallization method at 90 °C. The results indicated that, thanks to their chemical and mineralogical composition, both natural sources were proven to be useful raw materials for the potassium zeolite synthesis. However, the higher amount of silica in obsidian was found to be determining in merlinoite (MER topology) and, subordinately, merlinoite and chabazite intergrowths whereas the higher alumina content in bauxite controlled chabazite (CHA topology) synthesis. The synthetic products were also tested for magnetic properties and ammonia removal from polluted water showing positive results.

ID 89: THE HIGH-PRESSURE BEHAVIOUR OF MESOLITE: STRUCTURAL EVOLUTION AND H₂O REARRANGEMENT UNDER COMPRESSION

We conducted a multi-methodological study on mesolite combining neutron diffraction at low temperature and high-pressure X-ray diffraction. Hydrogen positions refined at 20(1) K allowed a precise description of the full H-bond network. Under non-penetrating media, mesolite compresses up to 4 GPa monotonically. Instead, in aqueous fluids (i.e., pure water and m.e.w. 16:3:1), mesolite adsorb H₂O molecules at ~0.8 GPa, causing a marked volume increase and reducing the channel ellipticity. Minor Ne incorporation is also suggested by residual electron density and discontinuities in the ψ deformation parameter.

ID 91: DEVELOPMENT OF A METAL-SUBSTITUTED NANO-ZSM-5 IMPREGNATED WITH ACTIVE ELEMENTS AS CATALYST FOR THE DEGRADATION OF VOCs EMITTED BY WOOD STOVES

Nano-ZSM-5 was bi-isomorphously substituted with metals and impregnated with Pt to produce a low-temperature catalytic layer for CO and VOCs oxidation from wood stoves. The novel combination of bi-substitution and nanosizing improves redox activity and active oxygen storage. The synthesis preserved MFI