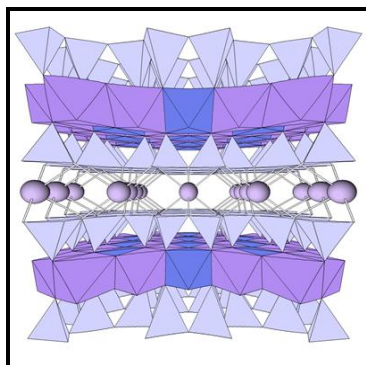
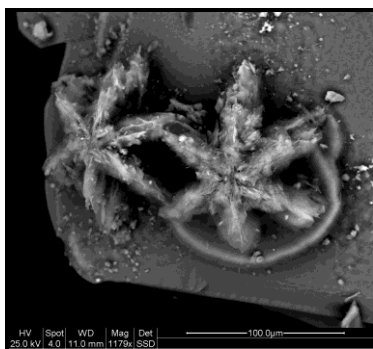


Crystal chemistry of phyllosilicates and clays

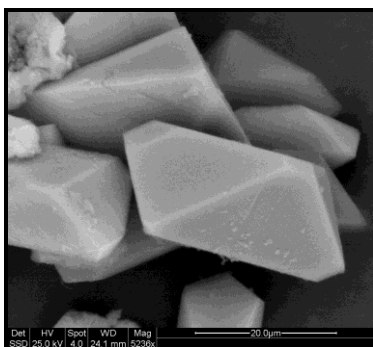
Maria Franca Brigatti, Daniele Malferrari, Chiara Elmi, Angela Laurora



Mica structural model



Lizardite from Modena Apennines



Rossiantonite

RESEARCH TOPICS

The overall aim of the research group is to developing researches related to mineralogy and material science. In particular, the group studies both the phyllosilicates' crystal chemistry and it researches on:

Structural studies on phyllosilicates. Understanding the crystal structures of layer silicates is fundamental on predicting the physical and chemical properties of these materials. Current works are examining structural studies on micas and phyllosilicates with unusual chemistries together with their thermodynamic aspects and magnetic properties.

Structure, composition, nanomorphology, surface cleavage potential of micas and chlorite, and specific applications. This research topic involves the crystallographic and crystal chemical characterization of the uppermost layers of micas and chlorites. The characterization of surface structure is important in several processes to understand mineral interactions with the surrounding environment, both in the Earth Sciences and in technological fields.

Optimization of adsorption and intercalation of pollutants in expandable layer silicates. The interactions between pollutants and clays represent an important part of environmental mineralogy. Understanding these interactions is critical to develop new materials for remediation of polluted ground waters and soils.

Crystal chemistry and characterization of new minerals.

Skills:

The group have reached a huge experience in the use of the following techniques:

- i) Single crystal X-ray diffraction (SC-XRD);
- ii) X-ray powder diffraction (XRPD) at ambient and non-ambient conditions;
- iii) Spectroscopic methods such as X-ray absorption spectroscopy (XAS) on both crystal bulk (K-edge) and surface (L-edge) and X-ray photoelectron spectroscopy (XPS);
- iv) Atomic Force Microscopy (AFM) and Scanning Electron Microscopy (SEM).

Collaborations:

Prof. Stephen Guggenheim, University of Illinois at Chicago, UIC
 Dr. Monica Montecchi, Dip. di Ingegneria "Enzo Ferrari", Unimore
 Prof. Annibale Mottana, Accademia dei Lincei, Roma
 Prof. Stefano Nannarone, Dip. di Ingegneria "Enzo Ferrari", Unimore
 Dr. Luca Pasquali, Dip. di Ingegneria "Enzo Ferrari", Unimore
 Prof. Fernando Scordari, Dip. Scienze della Terra e Geoambientali, UNIBA
 Prof. Giovanni Valdrè, Dip. SBGA, UNIBO

CONTACTS

Prof. Maria Franca Brigatti
mariafranca.brigatti@unimore.it
 Tel. +39 059 205 5805
 Fax +39 059 205 5887