

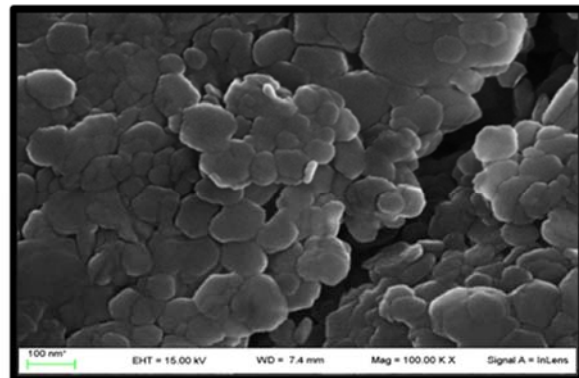
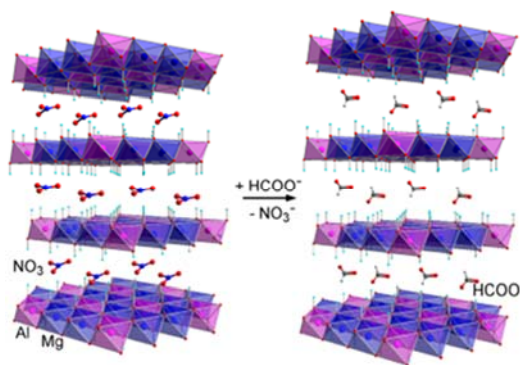
## Seminario

# Engineered sustainable cement based on nanomaterials: the case of LDH

Giovedì 24 ottobre 2024 – ore 16:30, Aula Arduino

Relatore: **Prof.ssa Paola Comodi**

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The sustainability of cement production is crucial for the construction industry, as it is one of the most widely used building materials and its production requires huge amounts of energy and is responsible for about 8% of global CO<sub>2</sub> emissions. It is therefore mandatory to improve their durability, deterioration and degradation over time. Different strategies have been employed, using additional cement materials, sometime in form of nanoparticles, to reach these aims. For example, the implementation of colloidal silica or carbon nanotubes in the design of concrete mixture, have shown promising results in the fresh properties and durability of concrete

In more recent time, Layered Double Hydroxides (LDH) have come up as a new class of engineering materials. Known as anionic clays, they are both naturally occurring minerals, as member of hydrotalcite supergroup, and synthesizable easily and economically in the laboratory, with a controllable supramolecular structure. Their unique physico-chemical properties (e.g., anion exchangers, adsorbents, memory effect) ensure that they can have many applications in the cement industry in the capture CO<sub>2</sub>, Cl<sup>-</sup> and SO<sub>4</sub><sup>2-</sup> as well in the early strength and setting time.

The seminar presents new strategies for the synthesis of different LDHs in nanometric form and which is their “bottom up” impact in cement production, namely how the modified nanostructure affects structures and properties at micro and macroscale.

Proponente: **Luca Valentini**