

# **Bio-inspired materials for CO<sub>2</sub> capture and utilization**

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Tackling climate change is one of the bigger challenges in modern time and involves major changes to all sectors of society. Ways to lower emissions, reduce the atmospheric concentration and incorporate utilization of CO<sub>2</sub> in chemical industry are of major importance. A key role in these processes is played by innovative materials: thousands of new sorbents and catalysts for CO<sub>2</sub> capture and/or utilization are proposed each year. Due to the relatively high inertness of CO<sub>2</sub>, the design of new materials for its capture and conversion requires a careful selection of the active centers and their chemical environment. In this perspective, inspiration offered by nature is a valuable tool to design new materials: biological systems are in fact the most efficient and finely tuned CO<sub>2</sub> capturers and converters. In this contribution, some examples of materials inspired by biological systems studied in our research group (including silica-supported amines, amino-modified MOFs and amino-acids based ionic liquids) and their potential toward CO<sub>2</sub> capture/utilization will be discussed. Beside the structural features of these materials, their reactivity toward CO<sub>2</sub> will be commented on the basis of the advanced spectroscopic tools available in the NIS center.