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ONLINE LECTURE

"Reticular Chemistry and Metal Organic Frameworks for Diverse Applications"

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Thursday, November 10, 2022, 12:00

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Reticular Chemistry and Metal Organic Frameworks for Diverse Applications

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Metal organic frameworks (MOFs) represent a unique class of functional crystalline materials resulting from the combination of organic linkers and metal ions or clusters with tunable chemical composition, diverse structures, and exceptional porosities. They demonstrate remarkable sorption and chemical properties, and for this reason MOFs are important candidates for key technological applications related to energy and environment, including gas storage/separation, purification, catalysis, and sensing.

More specifically, the linker's topology as well as the metal clusters geometry (i.e., secondary building unit, SBU) are the key factors which dictate the material's crystal network topology, therefore its structural characteristics (e.g., pore shape and size). Thus, the strategically choice of the aforementioned building units enables the accurate design and the successful synthesis of a plethora of novel materials with desired physicochemical characteristics for targeted applications.

In this attempt for guided synthesis of tailor-made materials, Reticular Chemistry has emerged as a powerful tool. In particular, in the field of MOFs has played a vital role in its exponential development. Through the successful implementation of Reticular Chemistry principles, the appropriate combinations between organic and inorganic building blocks were realized and the synthesis of a plethora of MOFs with fascinating topologies and intriguing properties for diverse applications were synthesized

In this talk, we will focus on representative examples regarding the guided synthesis of MOFs through the utilization of symmetrical building blocks and the study of their applications. [1,2] Also, intriguing examples of MOFs going beyond Reticular Chemistry predictions, based for example on non-symmetrical building blocks, along with their remarkable properties will be presented and discussed. [3,4]

REFERENCES

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