

Seminario

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Porous Materials for the Manipulation of Gases, Vapors and Polymers: Synthesis, Structural Characterization and Rotor Dynamics

Aula Seminari

Dipartimento di Chimica, Università degli Studi di Roma “Tor
Vergata”

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Porous Materials for the Manipulation of Gases, Vapors and Polymers: Synthesis, Structural Characterization and Rotor Dynamics

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Porous materials, inorganic, organic or hybrid, are receiving large interest from chemical and physical perspectives because they combine extended surface interactions with nanospaces appropriate for confinement of atoms and molecules to unusual aggregation states. Their function ranges from storage or separation of gases of remarkable environmental and energetic importance to applications as polymerization vessels for modulating polymer properties (structure, electrical conductivity, reinforcement and morphology). The extremely high surface area, which may overcome 5000 m²/g, enhances the interactions with guests originating new phenomena. We have recently discovered an innovative property of porous materials: the intrinsic dynamics for the presence of fast molecular rotors in their structure with correlation times on the nanosecond scale. Solid state NMR played an important role for the determination of the relaxation and motional trajectories of chemical groups in the frameworks. Moreover, we achieved the systematic regulation of the rotor speed by the intervention of chemical species diffusing in, opening unconventional perspectives in responsive materials.

References

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