



EFFETTO DELLA MOBILITA' DEL LINKER SULL'INTRUSIONE DI ACQUA IN MATERIALI NANOPOROSI IDROFOBICI

Relatore

Prof. Meloni Simone

Correlatore

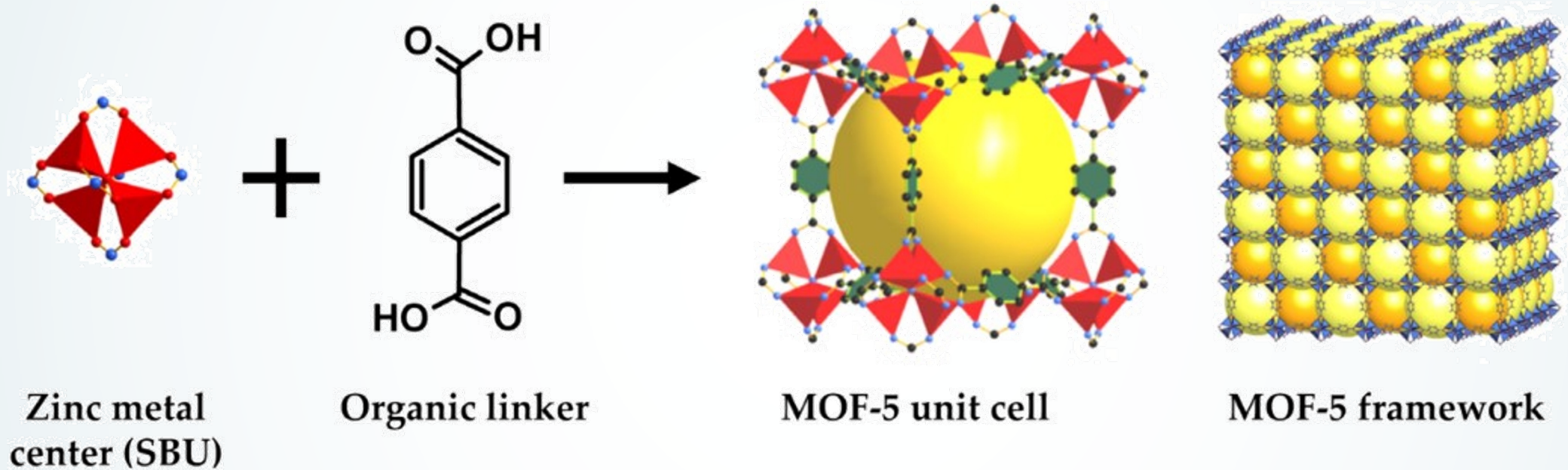
Dr. Le Donne Andrea

Laureando

Sigolo Gianmarco

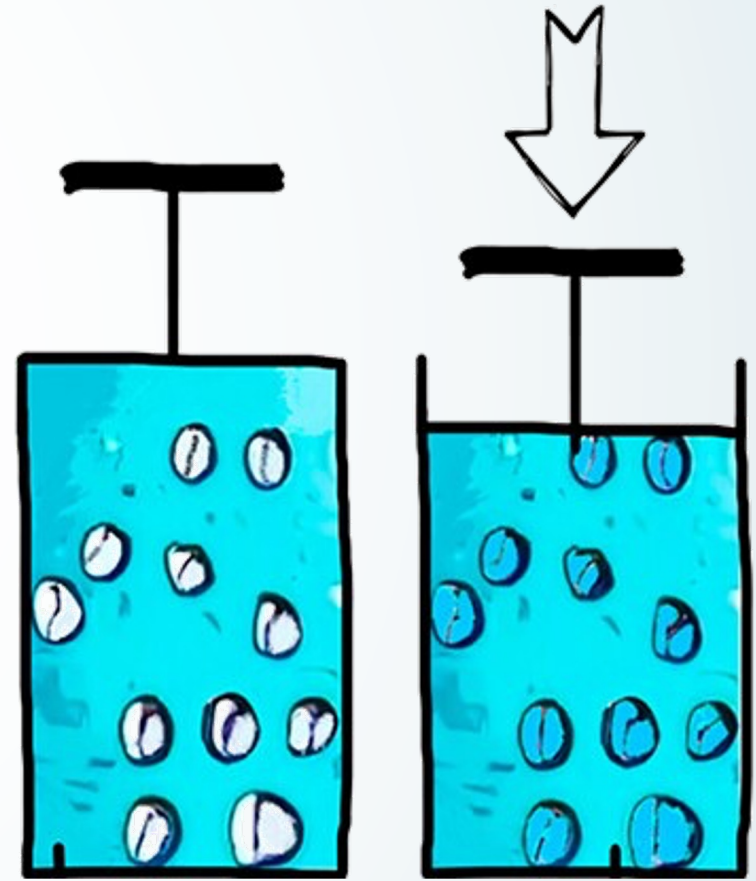
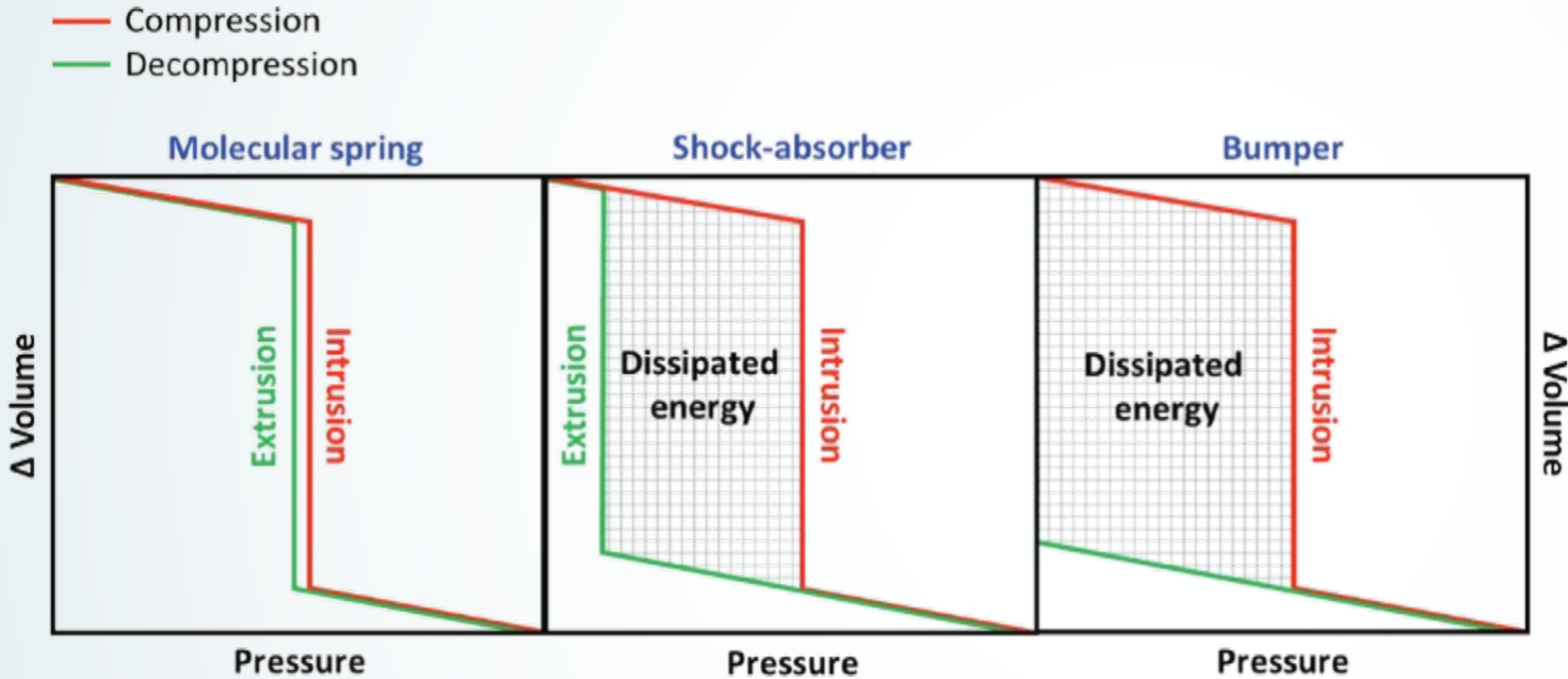
Anno Accademico 2022/2023

METAL-ORGANIC FRAMEWORK (MOF)



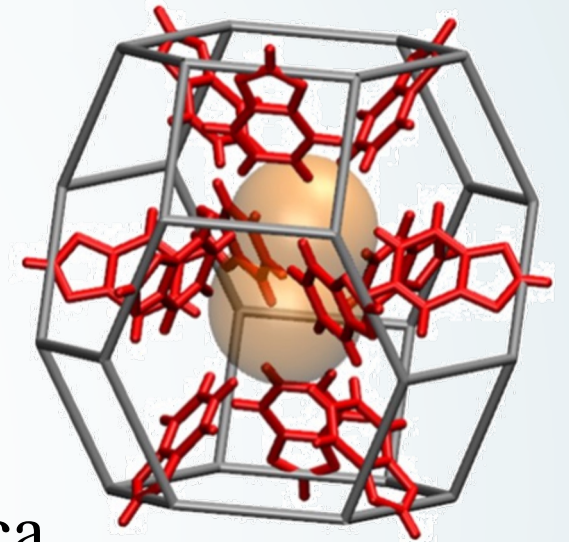
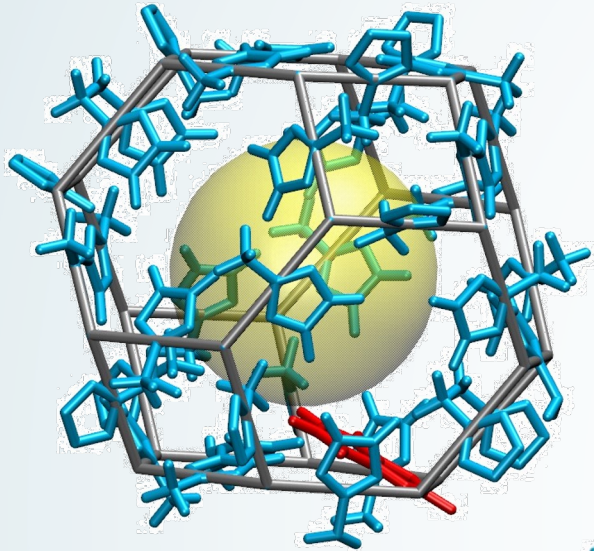
Edson V. Perez, Chamaal Karunaweera ORCID, Inga H. Musselman, Kenneth J. Balkus, John P. Ferraris, *Origins and Evolution of Inorganic-Based and MOF-Based Mixed-Matrix Membranes for Gas Separations, Processes*, (2016)

MATERIALI NANOPOROSI – LIQUIDO NON BAGNANTE: COMPORTAMENTI



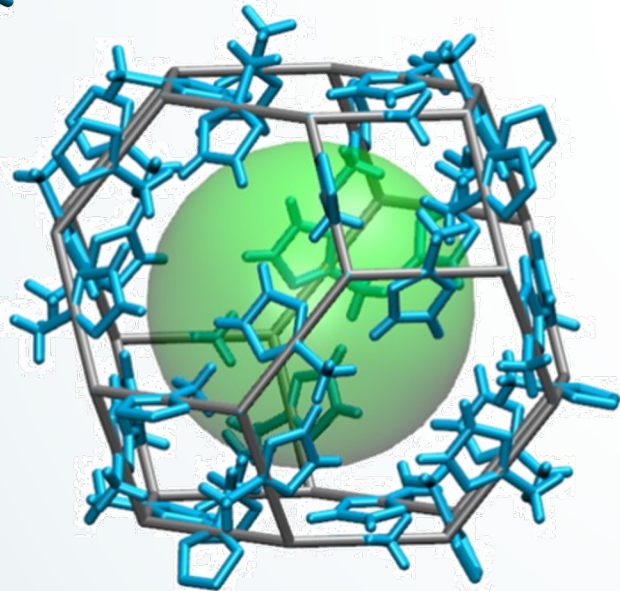
Andrea Le Donne, Eder Amayuelas, Antonio Tinti, Simone Meloni; *Intrusion and Extrusion of Liquids in Highly Confining Media: Bridging Fundamental Research to Applications*; Advances in Physics: X 7 (1): 2052353, (2022).

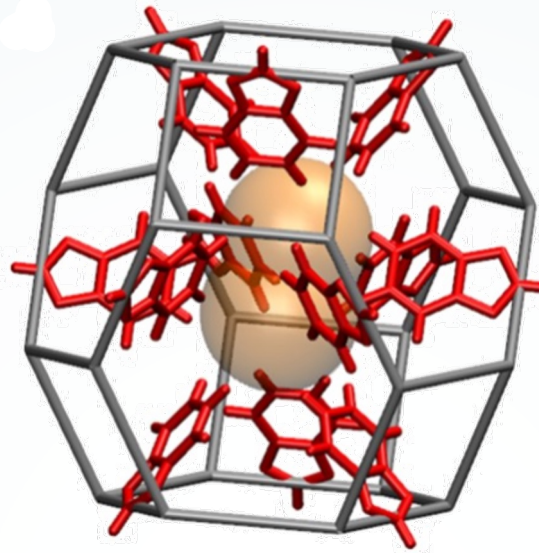
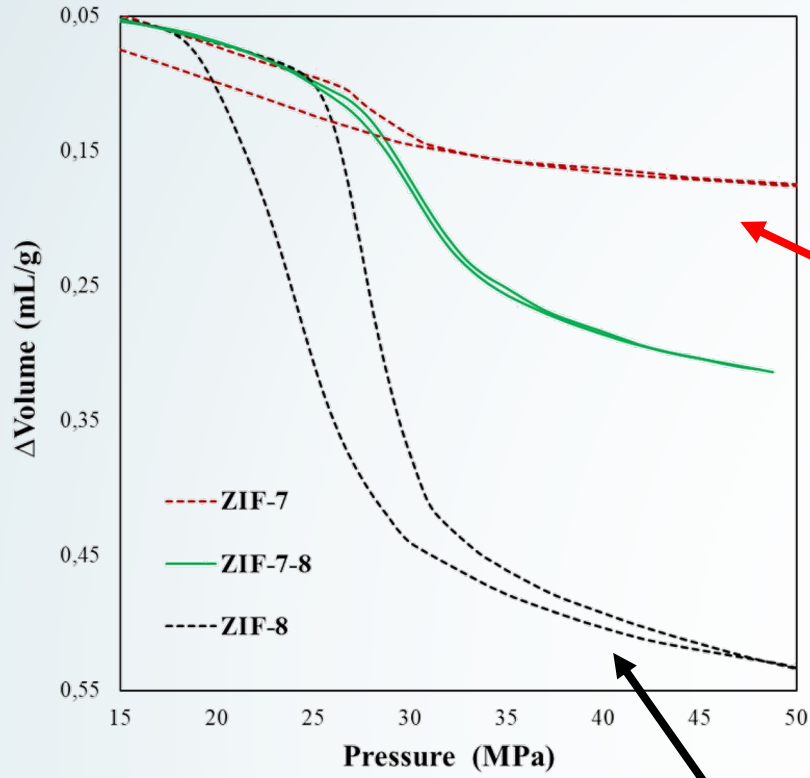
ZIF: ZEOLITE IMIDAZOLE FRAMEWORK



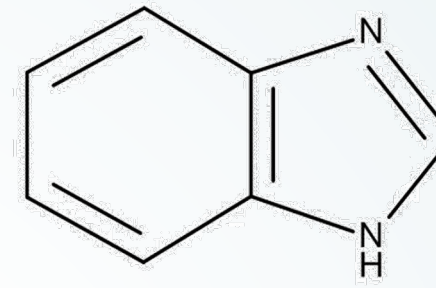
CARATTERISTICHE:

1. Stabilità termica e meccanica
2. Alta densità energetica
3. Risposta rapida ai cambiamenti della domanda di energia
4. Reversibilità
5. Basso impatto ambientale

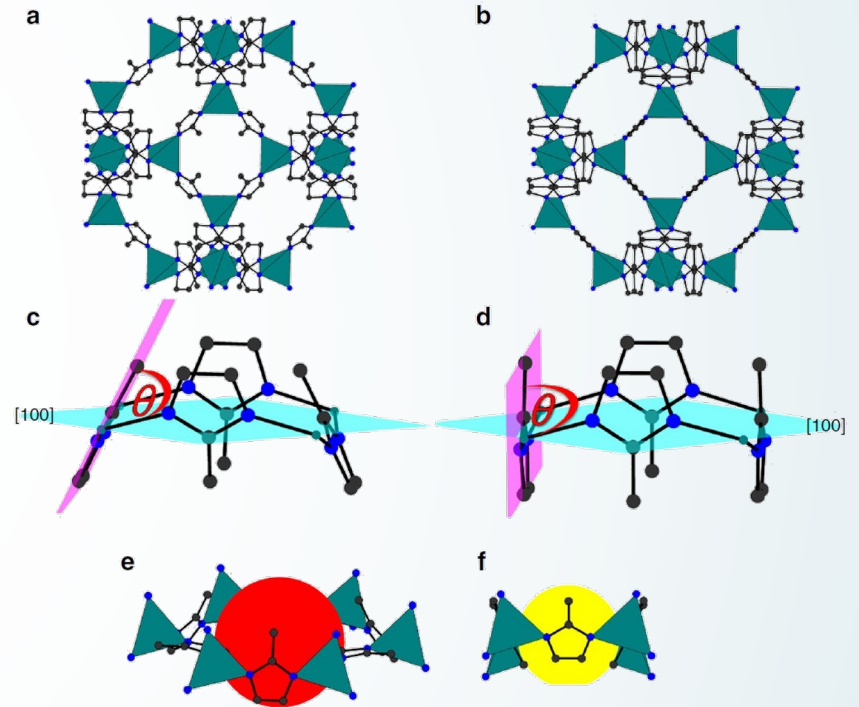




ZIF-7

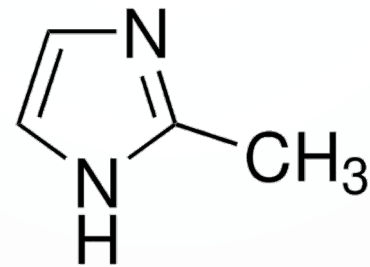
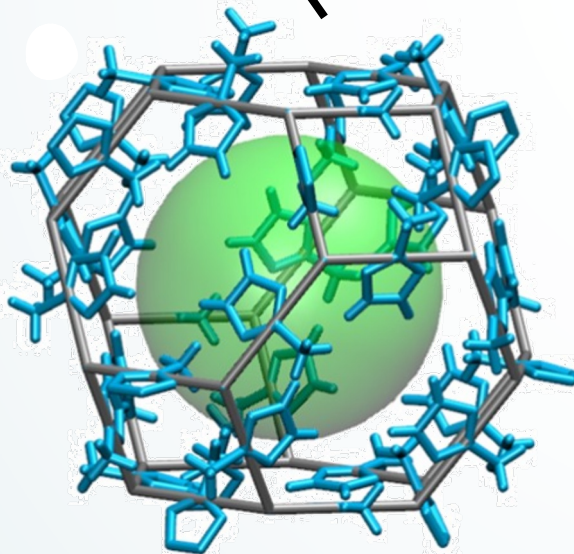


benzimidazolo

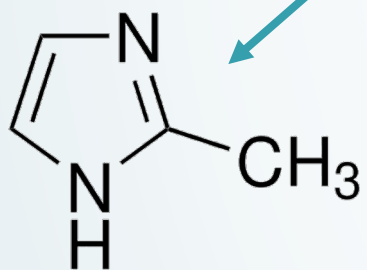
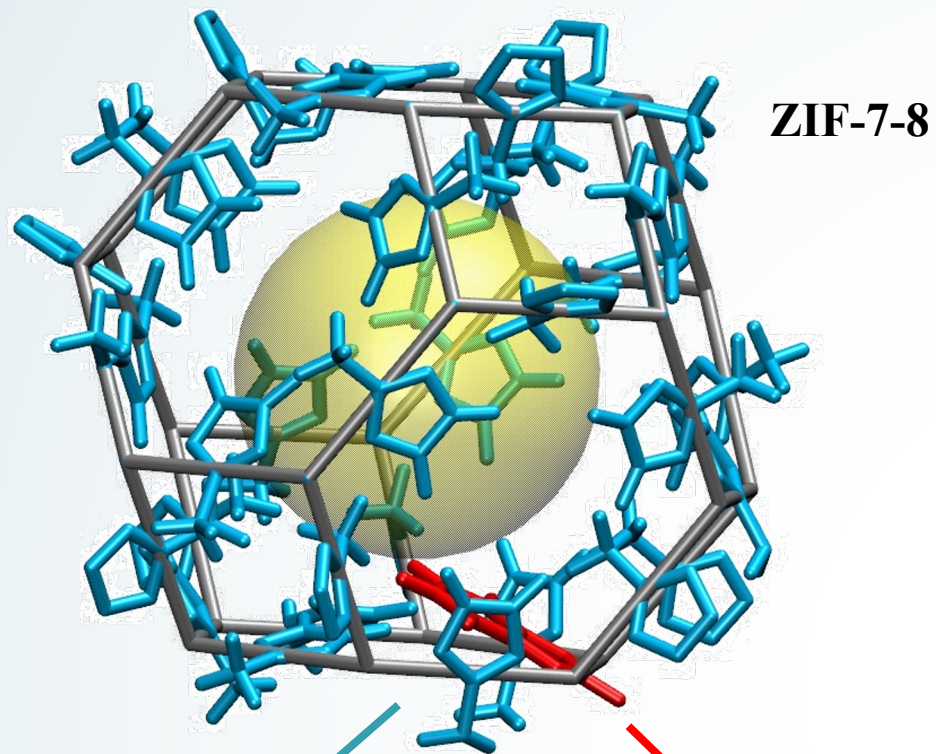


Claire L. Hobday, et al. , *Understanding the adsorption process in ZIF-8 using high pressure crystallography and computational modelling*, Nat Commun 9, 1429 (2018).

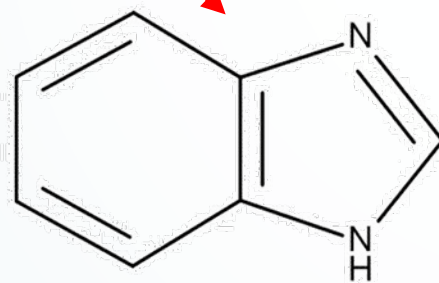
ZIF-8



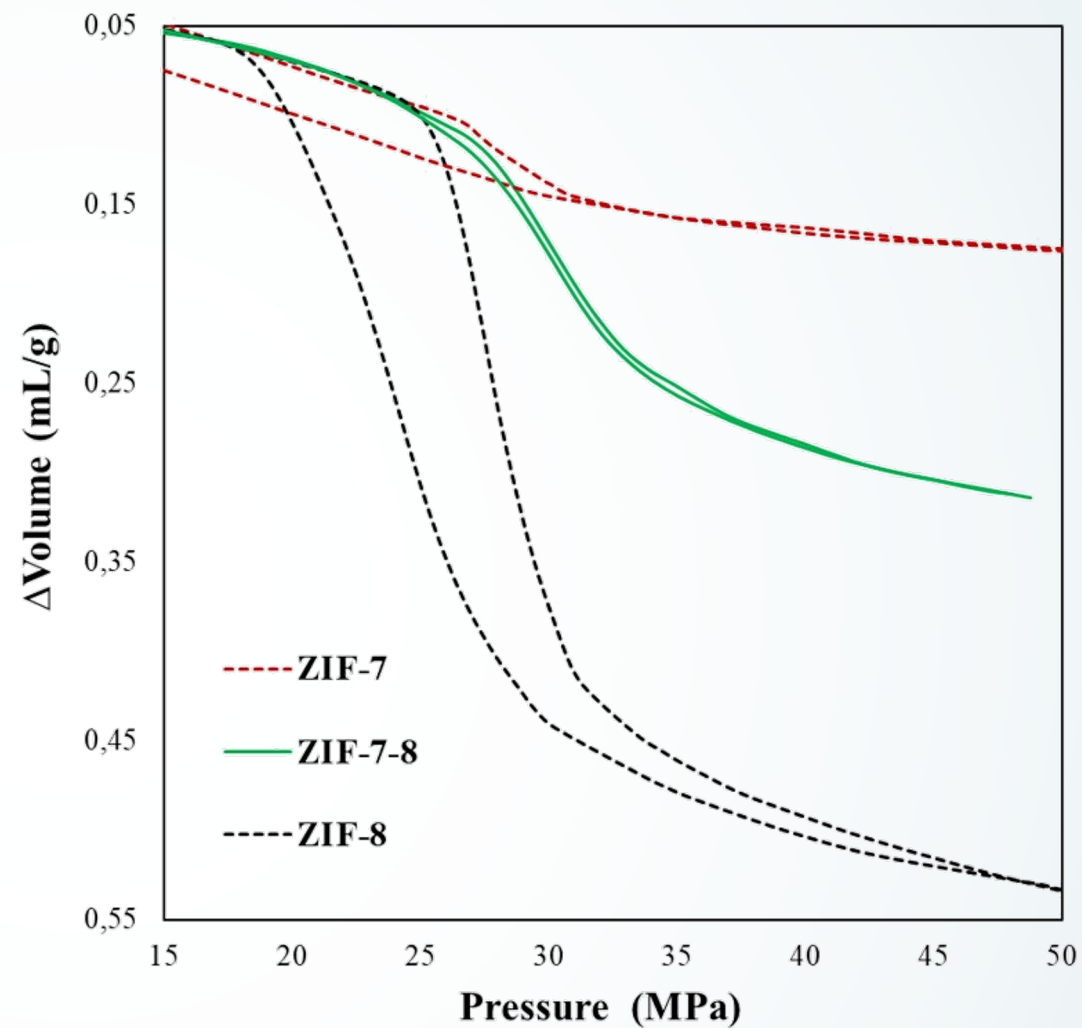
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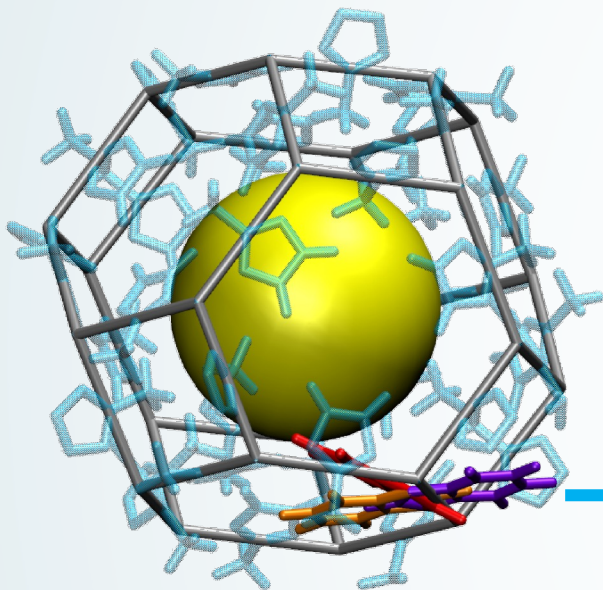


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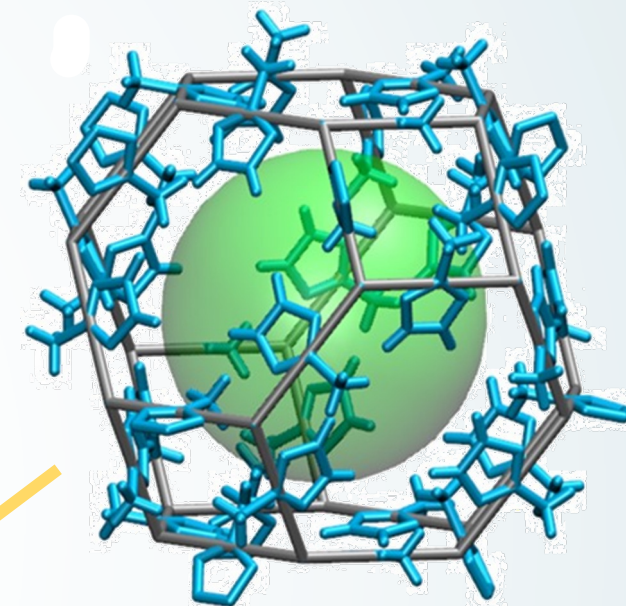
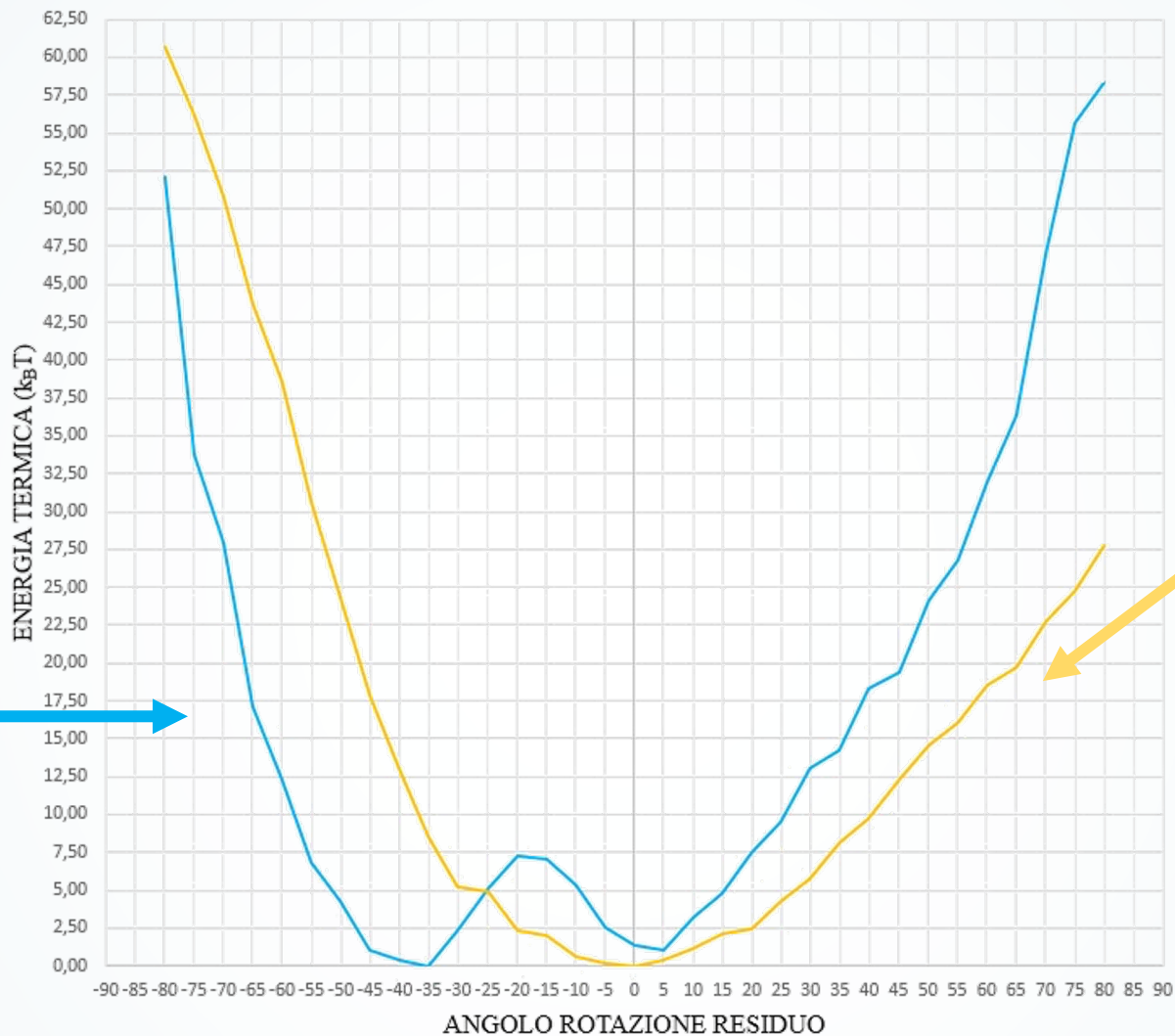


benzimidazolo

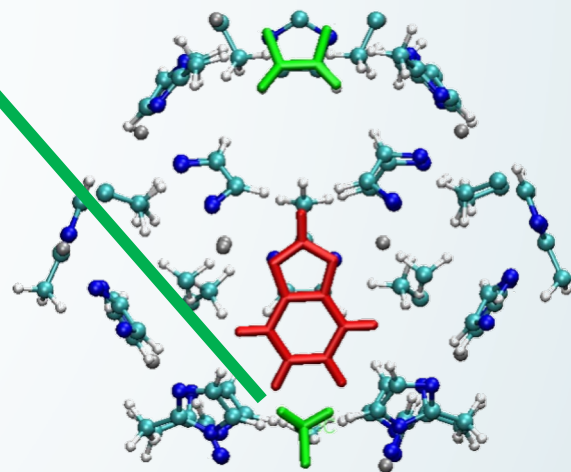
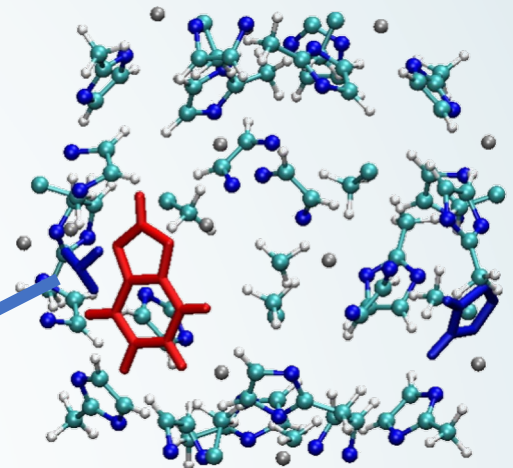
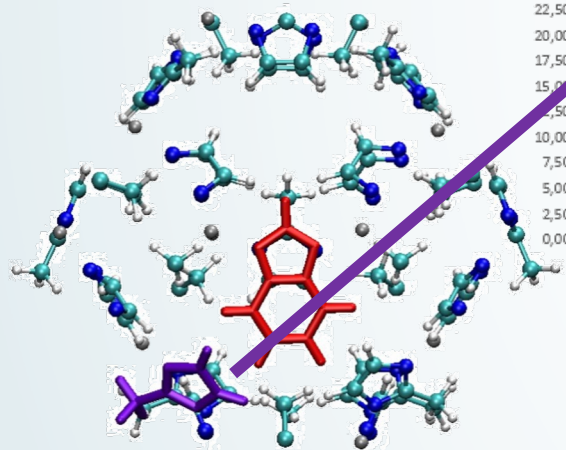
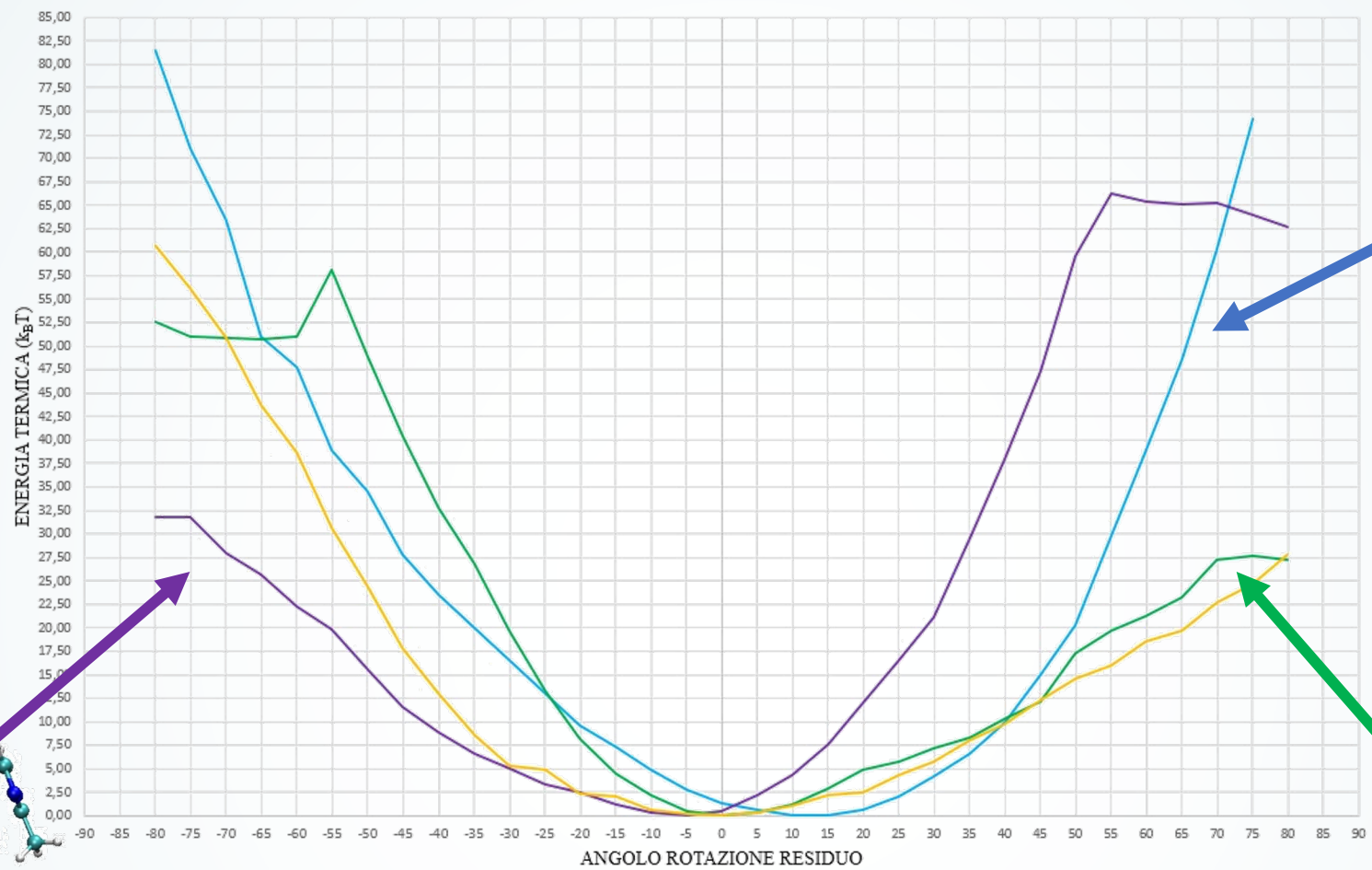


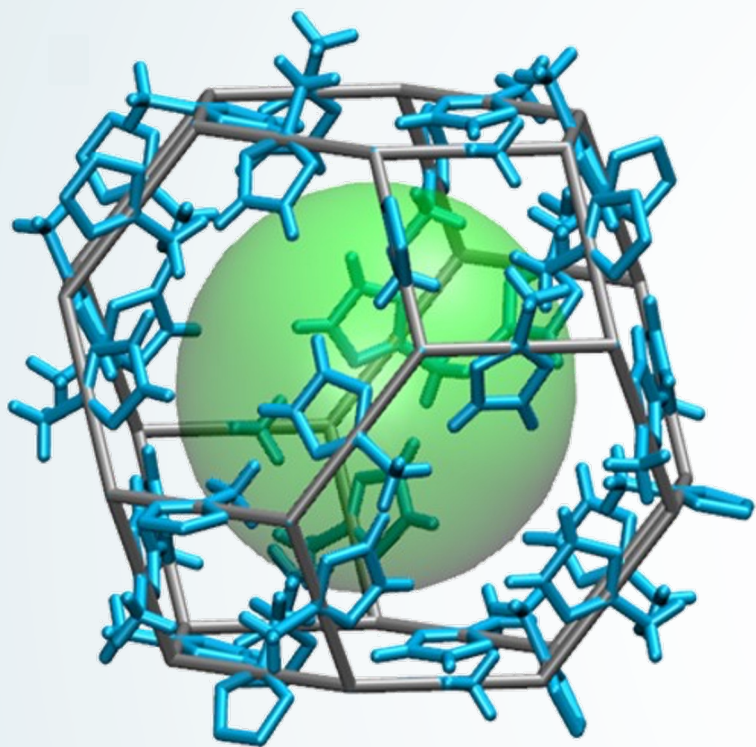


ZIF-7-8

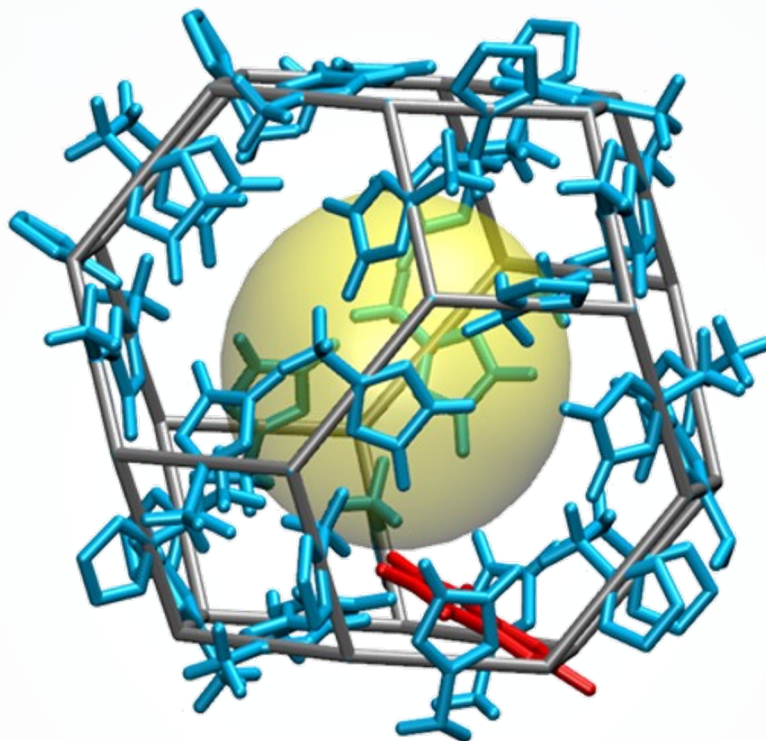


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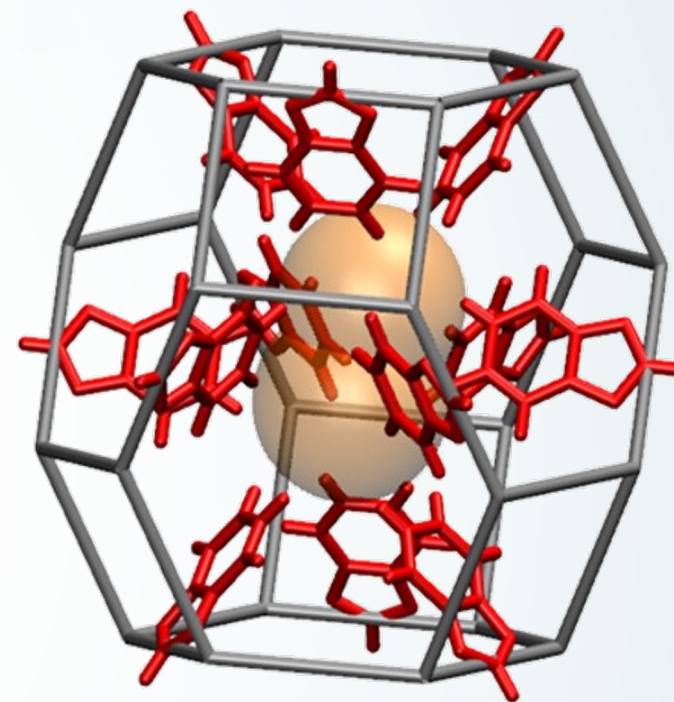




ZIF-8



ZIF-7-8



ZIF-7

CONCLUSIONI:

La presenza di benzimidazolo nella cella di ZIF-7-8:

1. Aumenta la rigidità del sistema
2. Aumenta la pressione di intrusione di acqua
3. Riduce il volume interno disponibile

I risultati di questo lavoro di tesi sono stati elaborati ed inclusi all'interno di un articolo che attualmente è sotto peer review presso la rivista *Nano Letters*



**Grazie per
l'attenzione!**



