



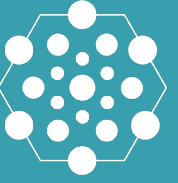
This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101017858

On the Exceptional Negative Compressibility of Zeolitic Imidazolate Frameworks (ZIFs) and Potential Application

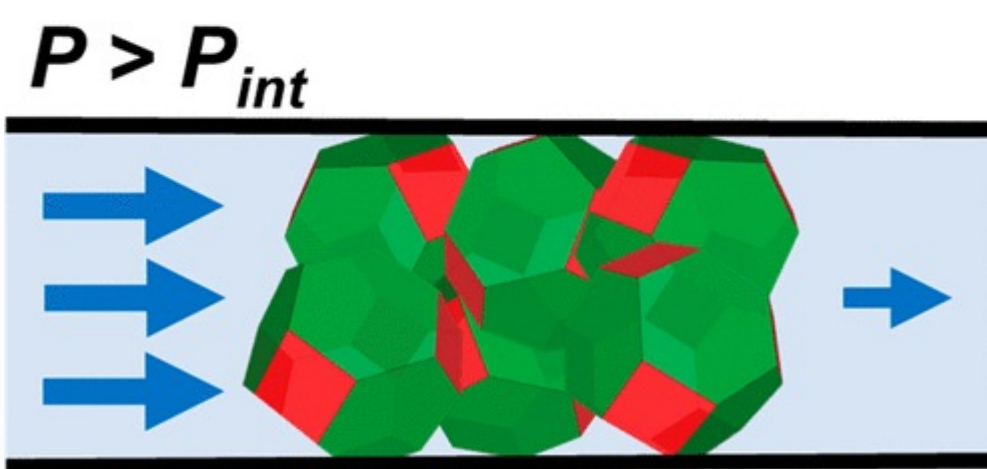
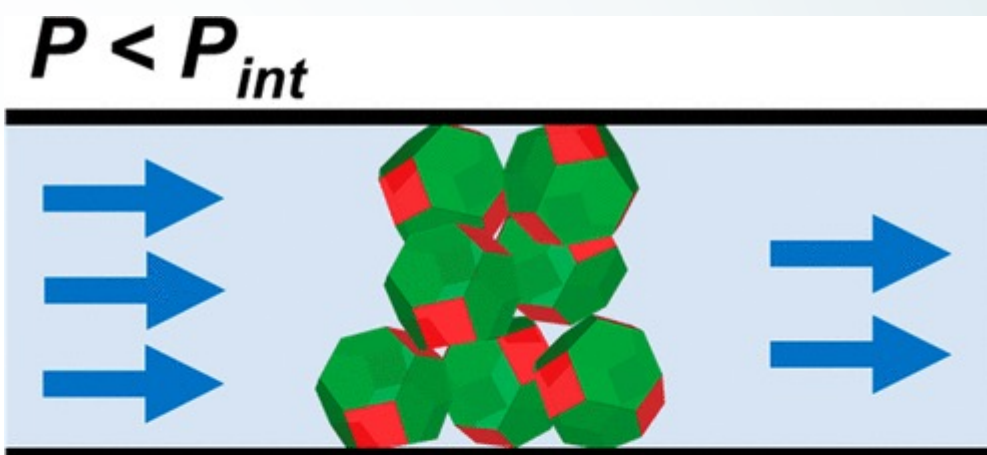
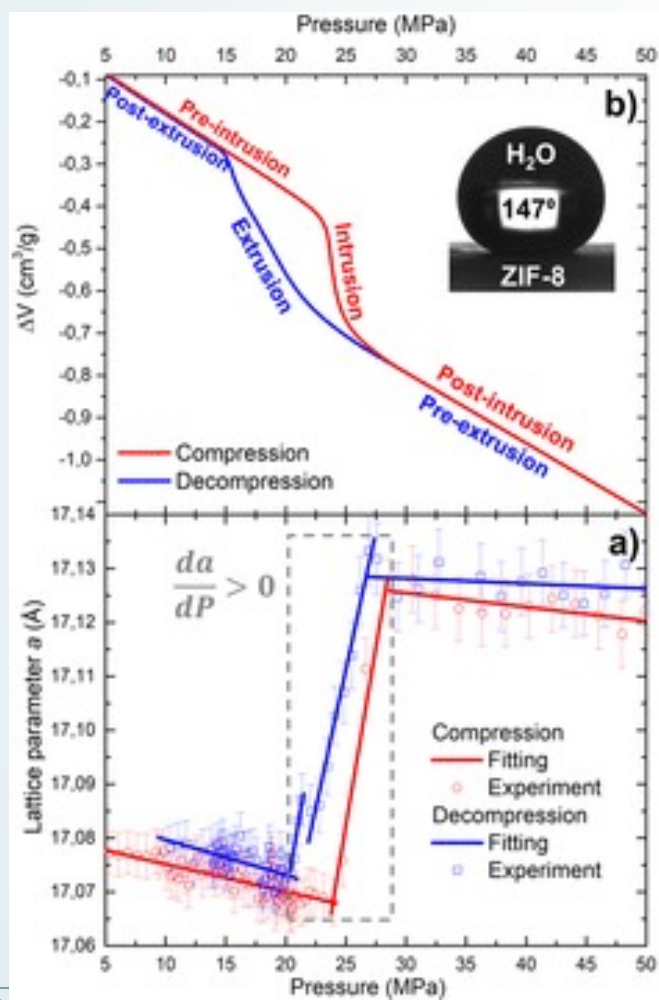
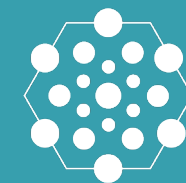
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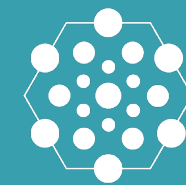
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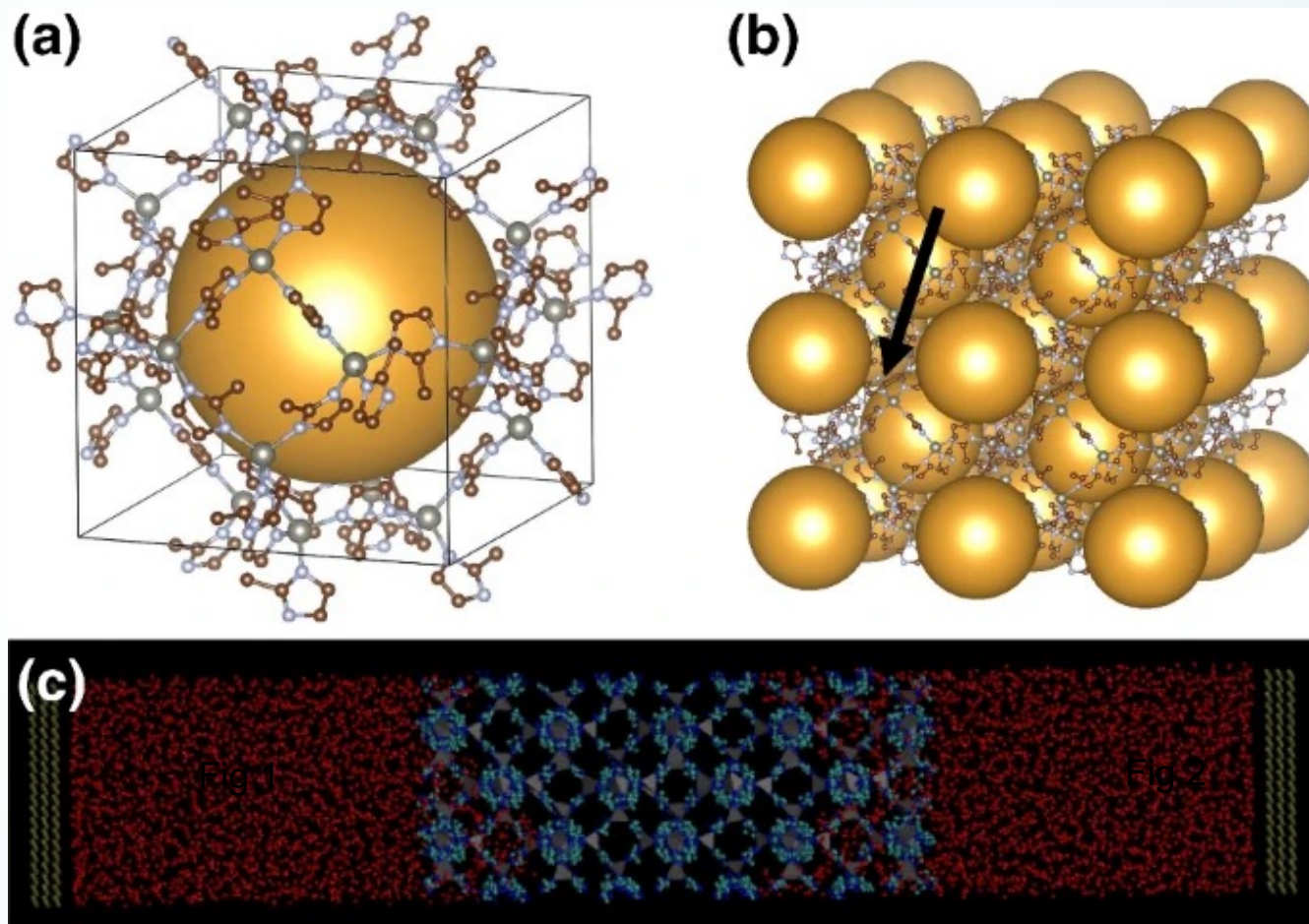
- Negative Volumetric Compressibility of ZIFs (herein ZIF-8)
- Hysteresis-based application of ZIFs (molecular spring, shock absorber)
- Exogenic modification of ZIF-8 hysteresis
- ZIFs as triboelectric nanogenerators



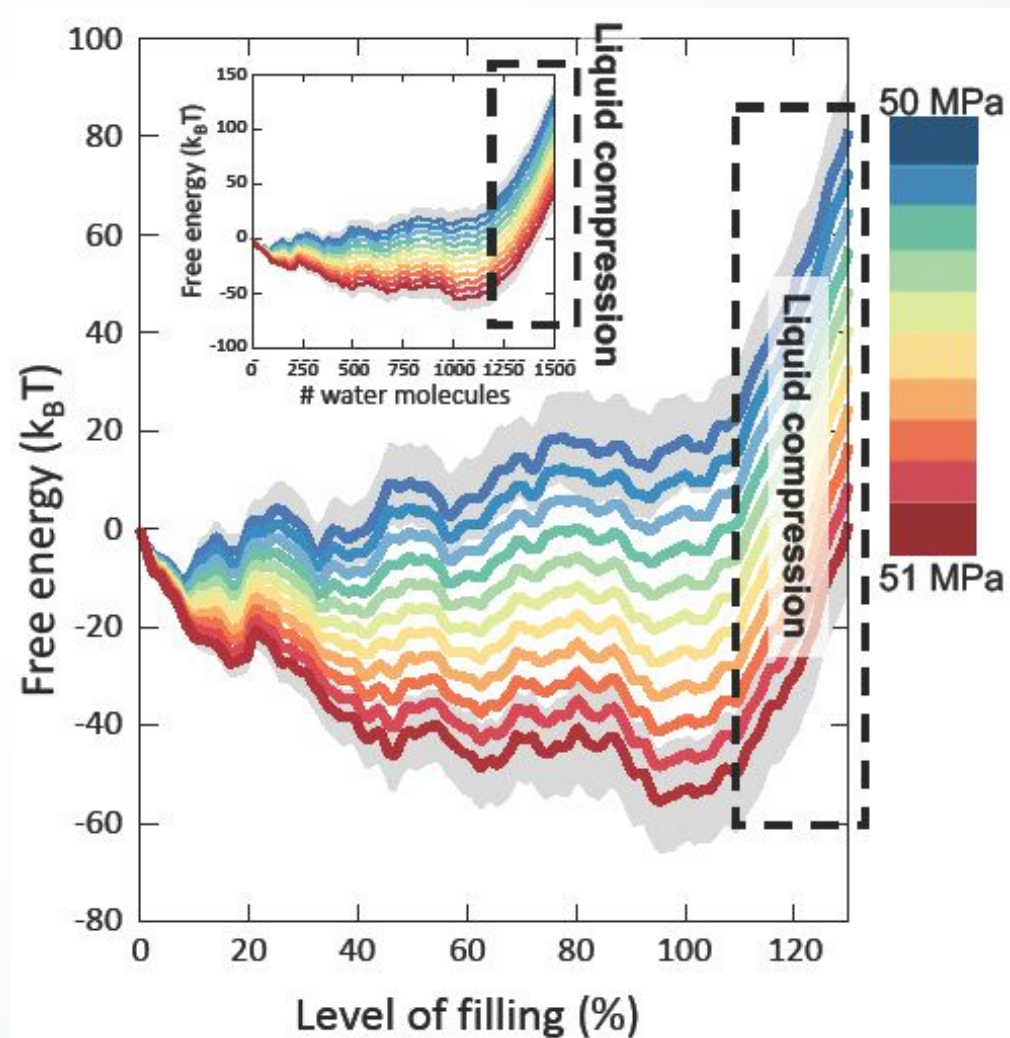
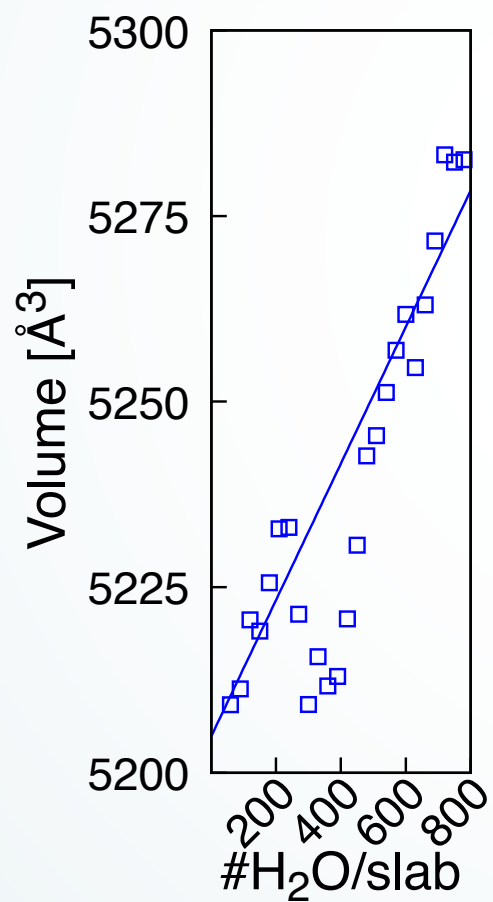
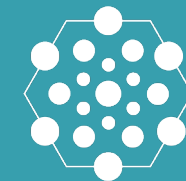
Intrusion-Extrusion ZIF-8 negative Compressibility

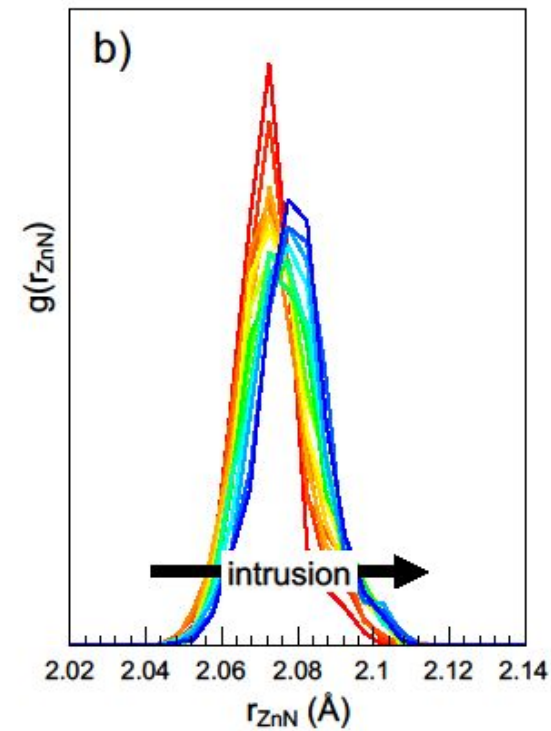
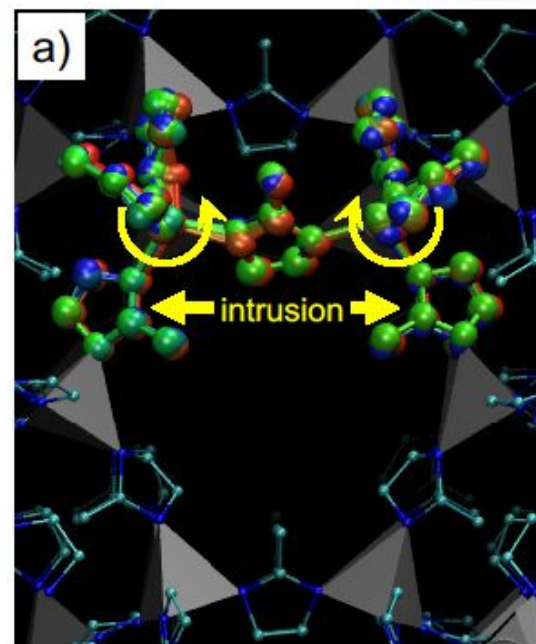
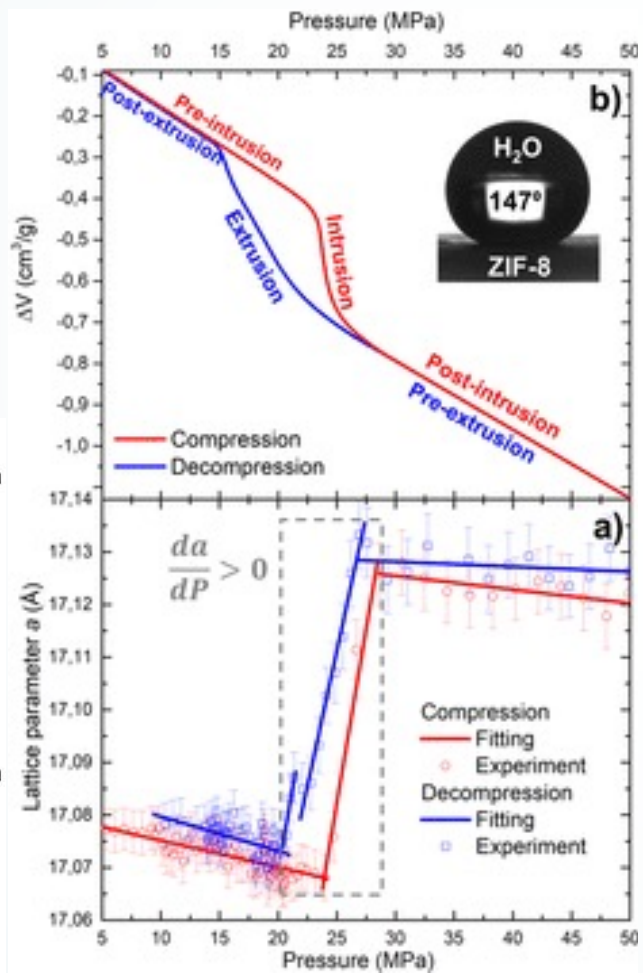
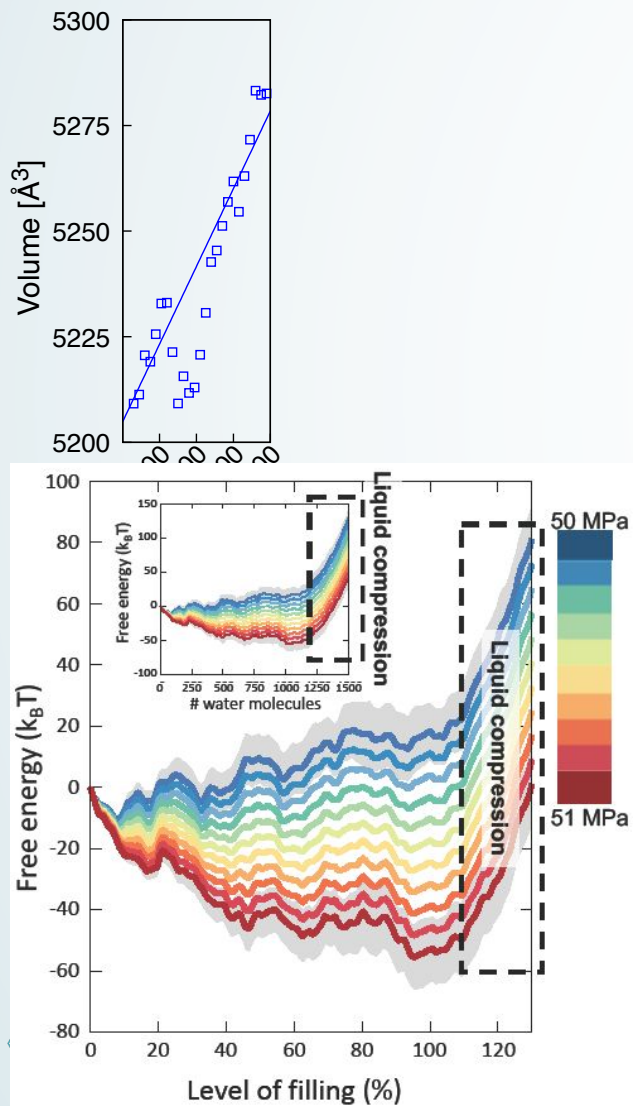
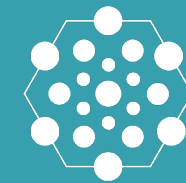


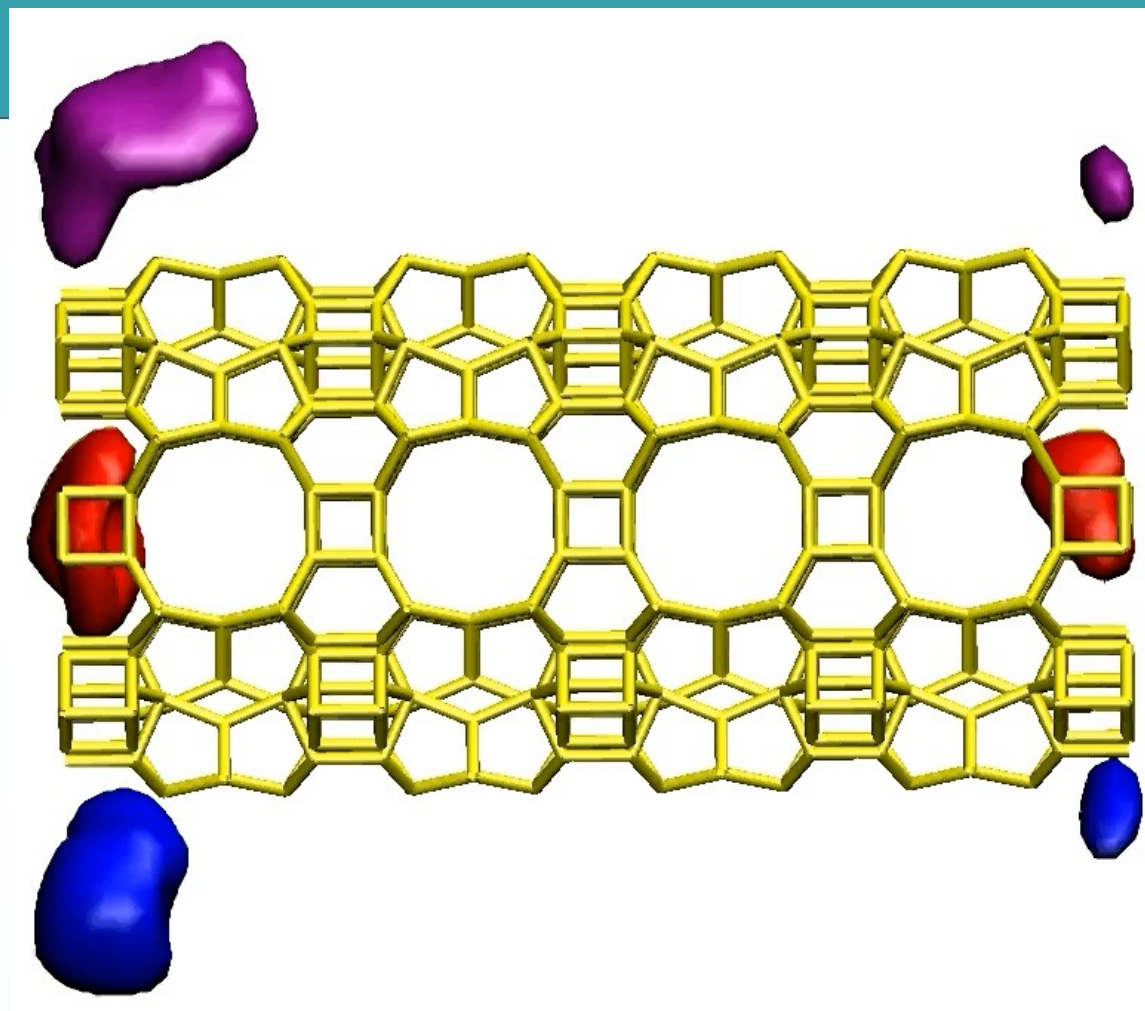
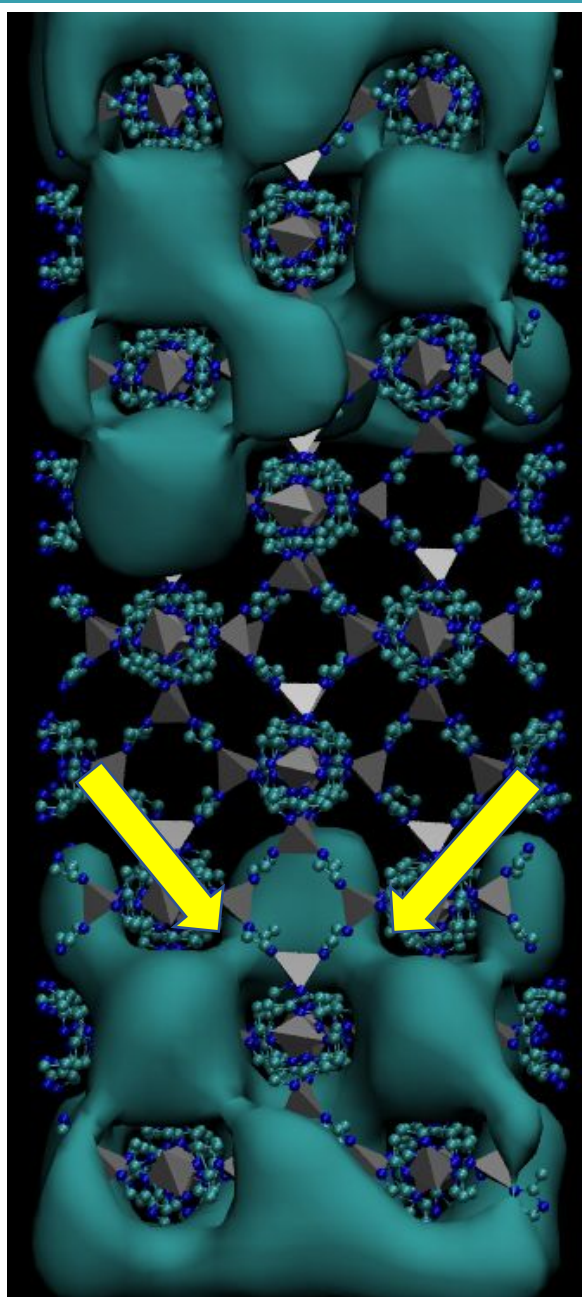
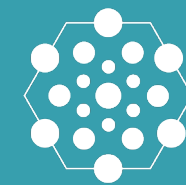
- Study of ZIF-8 NVC via liquid porosimetry and restrained molecular dynamics
- Revealed lattice expansion as a result of rotation of ZnM_4 tetrahedra and Zn-N bond length increase (fig 1h)



Tortora et al. *Nano Lett.* 2021, 21, 7, 2848–2853



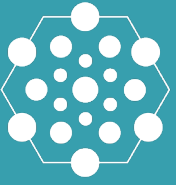




<https://doi.org/10.1021/acs.nanolett.1c02140>

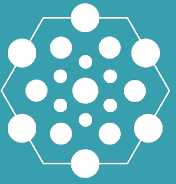


Conclusions So Far and Future Research Direction



- ZIFs possess the highly rare property of NVC upon water intrusion.
- Via exploitation of ZIF intrusion-extrusion hysteresis, one can potentially utilise ZIF-8 for energy storage, dissipation or transfer into electrical energy
- Recently, H2020 funding was granted for the Electro-intrusion collaboration to study the viability of using ZIFs and other hydrophobic materials as nanotriboelectric generators

Fellow Authors and Special Thanks



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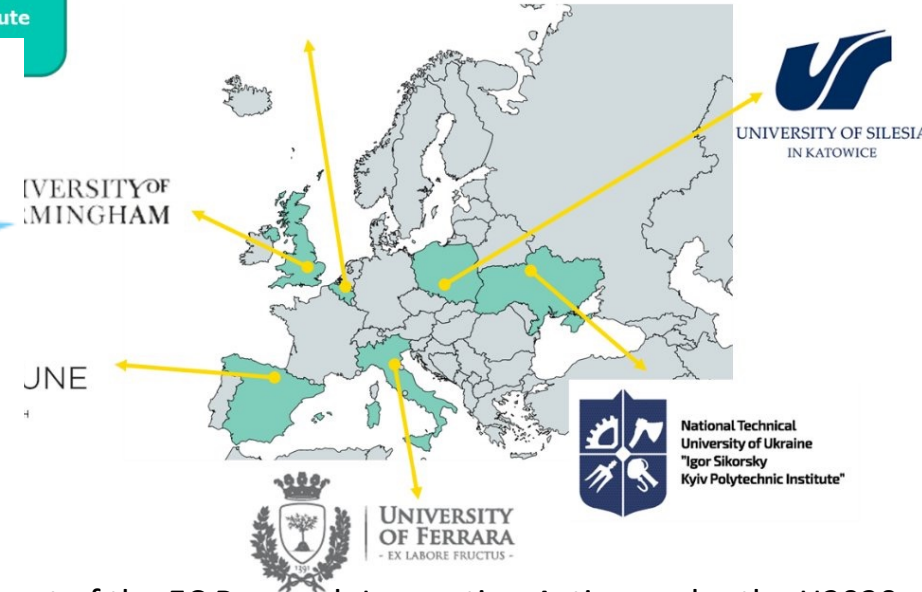
Grethe

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Thanks for your attention!



ELECTRO
INTRUSION