

MOF Post-Synthetic Modifications: Tales of Ordinary Disorder

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Among porous materials, Metal-Organic Frameworks¹ (MOFs) can exhibit a unique structural flexibility, which consists in the capability to adapt the framework geometry, and sometimes even chemical structure to post synthetic modifications (PSM) without altering the native topology. On the one hand this can be used to alter their functional behaviours and thereby substantially increase the number of MOF materials, on the other hand the PSM often introduces structural defects which can significantly alter the chemical and physical properties of the MOF. This research describes how the structure of a renowned MOF, namely IRMOF-9², reacted to different treatments such as solvent replacement³, cation exchange and internal functionalisation. In all the presented cases, the flexibility of the framework allowed to obtain samples suitable for Single-Crystal XRD. A careful total scattering approach afforded precious insights on the introduced structural changes including specific types of defects and the chemical reasons for their presence.

¹ Furukawa H., et al. (2013) *Science*, 341 (6149), 1230444

² Eddaoudi M., et al. (2002) *Science*, 295 (5554), 469-472

³ Canossa, S. et al. (2018) *Isr. J. Chem.*, 2018, 58, 1–8