

*Covalent organic framework thin-films for molecular separation*

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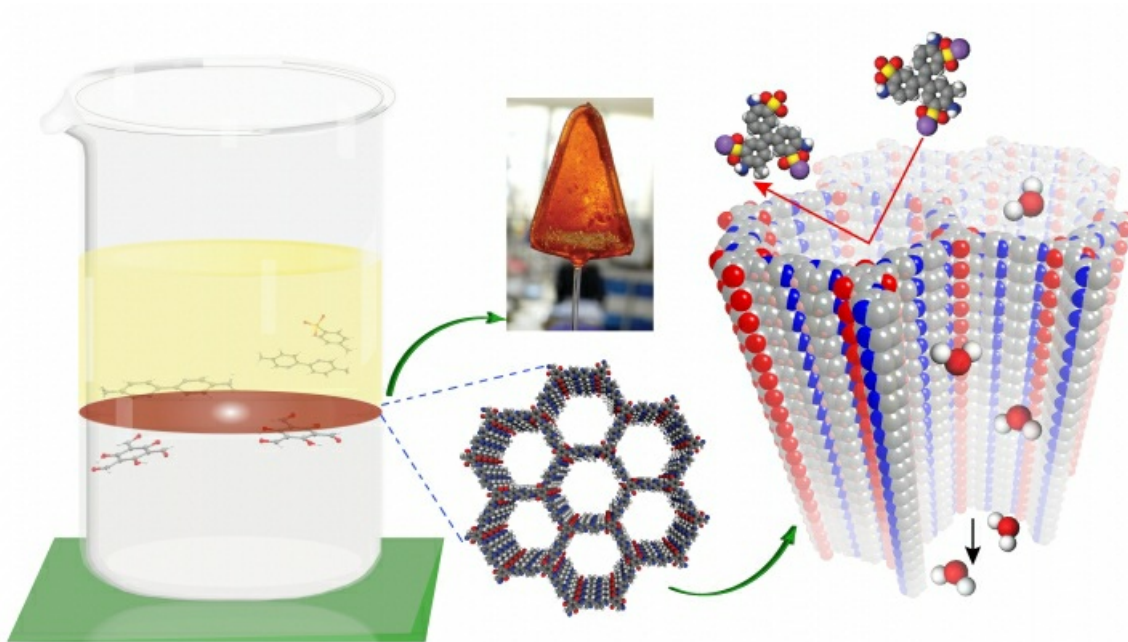
Covalent Organic Frameworks are a class of layered crystalline porous polymers composed of light weight elements with covalent bond linking between the atoms in plane and weak pi-pi interactions in between layers. These materials show enormous potential to be applied in catalysis, energy storage devices and separation technologies. However as obtained mainly in insoluble powder form, fabrication and processability of these porous materials still remains a great challenge.

Thin films of polymers are well reported in literature but being amorphous the structure to property relationship is not well understood in them. One of the challenges in crystalline polymers is to make self-standing films out of them as they compose of crystallite particles with grain boundaries and domains. We have used an interfacial crystallization approach to develop self-standing thin-films of these porous crystalline polymers. We can control the thickness of these thin-films by varying concentration of the precursors. These COF thin-films possess long range order as confirmed by PXRD analysis as well as permanent porosity evaluated from N<sub>2</sub> adsorption isotherm.

Furthermore we have used these crack-free thin-films in selective separation of different organic dye molecules which are identified as water contaminants. These COF thin films show effective removal of these pollutants and can be recycled many times without loss of their performance.

[1] Khayum, M. A. et al (2016). *Angew Chem. Int. Ed.*, 55, 1-6.

[2] Kandambeth, S et al (2017). *Adv. Mater.*, 29, 1-9



**Keywords:** [Covalent Organic Framework](#), [Thin-Films](#), [Separation](#)