

Internal Seminar

COF and MOF thin film membranes with subnanometer pores for metal ion-sieving

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The membrane separation technology has grown rapidly in the last few decades because of its low energy consumption, low carbon footprint, simple operation, and scalability. The quest for porous membranes exhibiting ultrafast ion permeation and exceptional ion selectivity has intensified, driven by the need for effective mineral separation, water purification, and energy conversion processes. However, effectively differentiating monatomic ions with identical valence and closely matched sizes continues to pose a significant challenge in the development of synthetic membranes. A suitable membrane material with consistent pore channels and crystallinity is therefore highly desirable. Porous crystalline materials, Covalent and Metal organic frameworks (COFs and MOFs) have been the subject of substantial research as potential membrane materials because of their benefits over conventional polymeric membranes in terms of having high permeability and good selectivity. Present study proposes an efficient and simple method to create flexible and free-standing pure COF membranes via the liquid-liquid interface-confined reaction. Additionally, we explored the MOF thin films to investigate their ion transport properties and consequently, their capacity for osmotic power generation.

Wednesday, Apr 17th 2024

16:00 Hrs

CR-4, TIFR-H