Poster Presentation

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Ultrafast and nanomolar TNP detection in water by fluorescent MOF

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Examples of metal organic frameworks (MOFs) as multifunctional porous materials are in huge demand for their applications ranging from sensing, catalysis, gas/vapor sorption for storage and separation, drug delivery, etc.[1,2] For our continued contribution[3] to this emerging field, we have designed a series of new ligands to make multifunctional MOFs in high yields for showcasing their versatile applications in several areas. In this presentation, based on a new electron-deficient triazine-based dicarboxylate ligand 5-((4,6-diamino-1,3,5-triazin-2-yl)amino)isophthalic acid (H_2ATAIA), a 3D MOF {[Cd(ATAIA)].4H_2O}n (1) has been synthesized at two different temperatures and structurally characterized by numerous analytical techniques. This amine-functionalized fluorescent MOF has been applied for highly selective, sensitive and ultrafast detection of picric acid in water with a limit of 0.94 nM (or 0.2 ppb). Furthermore, in a prototype experiment the response to TNP vapor by 1 has shown similar results.

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[2] Lin, W. et al. (2015). Chem. Rev. 115, 11079.
[3] (a) Mandal, S. K. et al. (2013). Crystal Growth Des. 13, 3116. (b) Mandal, S. K. et al. (2014). Crystal Growth Des. 14, 6433.

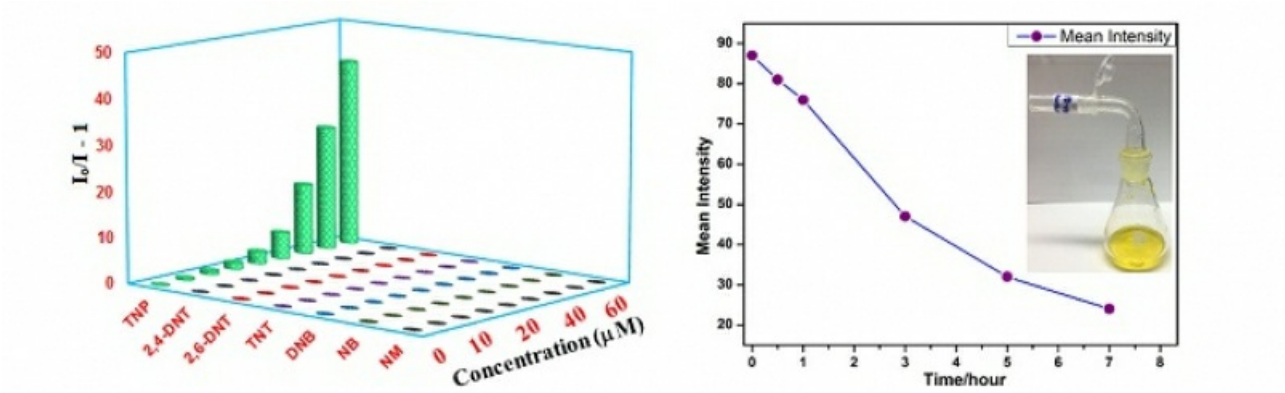

Figure. Stern-Volmer plot of all nitro analytes in water with nanomolar detection of TNP in **1** (left) and a prototype experiment indicating mean fluorescence intensity of **1** in presence of TNP vapor (right).

Keywords: Ultrafast Sensing TNP