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Title:	Structural Diversity in Luminescent MOFs Containing a Bent Electron-rich Dicarboxylate Linker and a Flexible Capping Ligand: Selective Detection of 4-Nitroaniline in Water
Authors:	Chakraborty, G. (/jspui/browse?type=author&value=Chakraborty%2C+G.) Das, Prasenjit (/jspui/browse?type=author&value=Das%2C+Prasenjit) Mandal, S.K. (/jspui/browse?type=author&value=Mandal%2C+S.K.)
Keywords:	Fluorescence sensing Luminescence Metal-organic frameworks 4-nitroaniline
Issue Date:	2019
Publisher:	Wiley Online Library
Citation:	Chemistry - An Asian Journal, 14(20),pp. 3712-3720.
Abstract:	A combination of a bent bis(naphthalene) and hydroxy-based dicarboxylate linker and a flexible bis(tridentate)polypyridyl ligand has been employed to self-assemble with two different d10 metal centers, ZnII and CdII, to form structurally diversified luminescent metal-organic frameworks, [Zn2(tpbn)(mbhna)2(H2O)2]·4 H2O·1.5DMF (1) and {[Cd2(tpbn)(mbhna)2]·2DMF} _n (2), respectively (where, tpbn=N,N',N'',N'''-tetrakis(pyridine-2-ylmethyl)butane-1,4-diamine and H2mbhna=4,4'-methylene-bis[3-hydroxy-2-naphthalene carboxylic acid]). Both 1 and 2 are characterized and analyzed by various analytical techniques including single-crystal X-ray diffractometry. Their excellent emissive nature is studied in different solvents and further utilized to selectively detect aromatic amines, particularly 4-nitroaniline in water with detection limits at sub-ppm level. The difference in sensing activity of 1 and 2 toward 4-NA is corroborated well with their structures. The mechanism of action has been established through Stern-Volmer plot, spectral overlap, time-resolved lifetime studies and HOMO-LUMO energy calculations. In addition, 1 and 2 are found to be recyclable and display good stability after sensing experiments.
URI:	https://onlinelibrary.wiley.com/doi/full/10.1002/asia.201900866 (https://onlinelibrary.wiley.com/doi/full/10.1002/asia.201900866) http://hdl.handle.net/123456789/1764 (http://hdl.handle.net/123456789/1764)
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