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Breaking the classical approach: achieving homologous topology modulation of Hydrogen-Bonded Organic Frameworks

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Classical synthesis of hydrogen-bonded organic frameworks (HOFs) involve several steps, making challenging the systematic construction of isoreticular HOFs, due to the flexibility and easily disruption of the connection linkages be-tween OLs.1 Herein, we develop an "integrated synthesis-assembly"(ISA) methodology for constructing a series of homologous topological DAT-C6-HOFs (-1, -2 and -3) by minimizing the possibilities of being disrupted during the synthesis and assembly of HOFs. The pore sizes and microenvironments of the yielding DAT-C6-HOFs can be tuned by varying the structural modulation of π-bridge on C3-symmetric cyano-precursors (C3-CPs). Moreover, the obtained DAT-C6-HOF-1 exhibited highly selective sensing towards perfluorooctanoic acid (PFOA) among homologous molecules, based on the matched of pore size and the synergistic regulation of intra- and inter- molecular charge transfer excited states. The definition of the ISA method not only provides new ideas for the de-velopment of synthetic methods for DAT-HOFs and other kinds of HOFs, but also opens up new avenue for the derivation of the templates for the oriented as-sembly of HOFs as well as the structural modulation of HOFs.

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