Table S1. Flexible MOFs for gas adsorption and separation applications

MOF	Stimulus mode	Gas storage/separation	Ref
MIL-53(Cr)	pressure	CO_2 adsorption	1
$[Zn_2(TBIB)_2(HTCPB)_2]\cdot 9DMF\cdot 19H_2O$	temperature	CO_2 adsorption	2
MIL-53(Al)	pressure, temperature	D_2/H_2 separation	3
SHF-61	guest molecule	CO_2/CH_4 separation	4
$Cu(dhbc)_2(4,4'\text{-bipy})$	guest molecule	$C_1/C_2/C_3$-propyne separation	5
LIFM-28	guest molecule	CO_2/N_2 separation	6
$[Zn_3(btca)_2(OH)_2]\cdot(guest)_n$	guest molecule	CO_2 adsorption	7
$Cu_4(m_4\text{-}O)(m_2\text{-}OH)_2(Me_2trz\text{-}pba)_4$	guest molecule, pressure	C_4-hydrocarbons adsorption	8
NOTT-202a	guest molecule	CO_2 adsorption	9
MIL-53(Al)-NH_2	guest molecule	CH_4 adsorption	10
TIFSIX-14-Cu-I	pressure	C_3H_6/C_3H_8 separation	11
ELM-12	pressure	C_2H_2/C_2H_4 separation	12
MIL-53(Al)	pressure, temperature	CH_4 adsorption	13
$Zn_2(Atz)_2Ox$	guest molecule	C_2H_2/C_2H_4 separation	14
NJU-Bai8	molecule	C_3H_6/C_3H_8 separation	15
$Mn(ina)_2$	temperature	Xe/Kr separation	16
$Cu_4(m_4\text{-}O)(m_2\text{-}OH)_2(Me_2trzpba)_4$	temperature	$C_2/C_3/C_4$-hydrocarbons separation	17
NKU-FlexMOF-1	temperature	C_3H_6/C_3H_8 separation	18
Co(bdp)	guest molecule	CO_2/CH_4 separation	19
$[Zn_2(C_{20}H_{12}O_4)_2(C_{10}H_8N_2)]_n$	guest molecule	N_2/CH_4 separation	20

Reference：

1. T. Devic, F. Salles, S. Bourrelly, B. Moulin, G. Maurin, P. Horcajada, C. Serre, A. Vimont, J.-C. Lavalley, H. Leclerc, G. Clet, M. Daturi, P. L. Llewellyn, Y. Filinchuk and G. Férey, *J. Mater. Chem. A*, 2012, **22**, 10266.
2. R. A. Agarwal, A. K. Gupta and D. De, *Cryst. Growth Des.*, 2019, **19**, 2010–2018.
3. J. Y. Kim, L. Zhang, R. Balderas-Xicohtencatl, J. Park, M. Hirscher, H. R. Moon and H. Oh, *J. Am. Chem. Soc.*, 2017, **139**, 17743–17746.
4. E. J. Carrington, C. A. McAnally, A. J. Fletcher, S. P. Thompson, M. Warren and L. Brammer, *Nat. Chem.*, 2017, **9**, 882–889.
5. L. Li, R. Krishna, Y. Wang, J. Yang, X. Wang and J. Li, *J. Mater. Chem. A*, 2016, **4**, 751–755.
6. C. X. Chen, Z. Wei, J. J. Jiang, Y. Z. Fan, S. P. Zheng, C. C. Cao, Y. H. Li, D. Fenske and C. Y. Su, *Angew. Chem.*, 2016, **55**, 9932–9936.
7. Y. Yue, J. A. Rabone, H. Liu, S. M. Mahurin, M.-R. Li, H. Wang, Z. Lu, B. Chen, J. Wang, Y. Fang and S. Dai, *J. Phys. Chem. C* 2015, **119**, 9442–9449.
8. M. Lange, M. Kobalz, J. Bergmann, D. Lässig, J. Lincke, J. Möllmer, A. Möller, J. Hofmann, H. Krautscheid, R. Staudt and R. Gläser, *J. Mater. Chem. A*, 2014, **2**, 8075–8085.
9. S. Yang, X. Lin, W. Lewis, M. Suyetin, E. Bichoutskaia, J. E. Parker, C. C. Tang, D. R. Allan, P. J. Rizkallah, P. Hubberstey, N. R. Champness, K. M. Thomas, A. J. Blake and M. Schroder, *Nat. Mater.*, 2012, **11**, 710–716.

10. T. Kundu, M. Wahiduzzaman, B. B. Shah, G. Maurin and D. Zhao, *Angew. Chem. Int. Ed.*, 2019, **58**, 8073–8077.
11. L. Yang, X. Cui, Y. Zhang, Q. Yang and H. Xing, *J. Mater. Chem. A*, 2018, **6**, 24452–24458.
12. L. Li, R.-B. Lin, R. Krishna, X. Wang, B. Li, H. Wu, J. Li, W. Zhou and B. Chen, *J. Mater. Chem. A*, 2017, **5**, 18984–18988.
13. T. Kundu, B. B. Shah, L. Bolinois and D. Zhao, *Chem. Mater.*, 2019, **31**, 2842–2847.
14. P.-D. Zhang, X.-Q. Wu, T. He, L.-H. Xie and J.-R. Li, *Chem. Commun.*, 2020, **56**, 5520–5523.
15. X. Wang, R. Krishna, L. Li, B. Wang, T. He, Y.-Z. Zhang, J.-R. Li and J. Li, *Chem. Eng. J.*, 2018, **346**, 489–496.
16. H. Wang, M. Warren, J. Jagiello, S. Jensen, S. K. Ghose, K. Tan, L. Yu, T. J. Emge, T. Thonhauser and J. Li, *J. Am. Chem. Soc.*, 2020, **142**, 20088–20097.
17. T. Hähnel, G. Kalies, R. Krishna, J. Möllmer, J. Hofmann, M. Kobalz and H. Krautscheid, *Microporous Mesoporous Mater.*, 2016, **224**, 392–399.
18. M.-H. Yu, B. Space, D. M. Franz, W. Zhou, C. He, L. Li, R. Krishna, Z. Chang, W. Li, T.-L. Hu and X.-H. Bu, *J. Am. Chem. Soc.*, 2019, **141**, 17703–17712.
19. M. K. Taylor, T. Runcevski, J. Oktawiec, J. E. Bachman, R. L. Siegelman, H. Jiang, J. A. Mason, J. D. Tarver and J. R. Long, *J. Am. Chem. Soc.*, 2018, **140**, 10324–10331.
20. E. R. Engel, A. Jouaiti, C. X. Bezuidenhout, M. W. Hosseini and L. J. Barbour, *Angew. Chem. Int. Ed.*, 2017, **56**, 8874–8878.