

**Table S1**  
Abbreviation table

Abbreviation	Full name
AI	Artificial intelligence
AO	Auramine O
ASH	4-aminosalicylicylhydrazide
BD	Benzidine
BG	Bright green
BPA	Bisphenol A
BPAF	Bisphenol AF
COFs	Covalent organic frameworks
CNTs	Carbon nanotubes
CONs	Covalent organic nanosheets
CTFs	Covalent triazine framework materials
CV	Crystal violet
DAA	2,5-diaminobenzoic acid
DB	2,5-dimethoxybenzaldehyde
DBD	Dielectric barrier discharge
DCF	Diclofenac sodium
DES	Deep eutectic solvent
DFT	Density functional theory
DMTP	2,5-Dimethoxybenzene-1,4-dicarboxaldehyde
DOS	Density of states
EEF	External electric field
GCMC	Grand canonical Monte Carlo
GWP	Global water partnership
HCOFs	Hollow COFs
HOF	Hydrogen-bonded organic framework
H <sub>2</sub> S	Hydrogen sulfide
LCA	Life cycle assessment
MA	Melamine
MB	Methylene blue
MCTP	Microporous triazine polymer
MG	Malachite green
ML	Machine learning
NCCT	NiFe <sub>2</sub> O <sub>4</sub> -COF-chitosan-terephthalaldehyde
NFs	Nanofiltration membranes
NO <sub>x</sub>	Nitrogen oxides
NSAID	Nonsteroidal anti-inflammatory drug
PA-1	P-phenylenediamine
PA-COF	Phenanthroline-based COF
PBBS	Polybrominated biphenyls
PCBs	Polychlorinated biphenyls
PEM	Proton exchange membranes
PFAS	Perfluorinated and polyfluorinated alkyl substances
PPNs	Porous polymer networks
RB	Rhodamine B
RT-iCOF	Room temperature-induced COF
SAMN	Self-assembled molecular network
SAs	Sulfonamides
SDGs	Sustainable development goals

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SO <sub>x</sub>	Sulfur oxides
SPME	Solid phase microextraction
TAPB	1,3,5-tris(4-aminophenyl)benzene
Tab	1,3,5-tris(4-aminophenyl)benzene
TAM	Tetrakis(p-aminophenyl)methane
TFP	Triformylphloroglucinol
TFPPy	1,3,6,8-Tetrakis(4-formylphenyl)pyrene
TM	Transition metal elements
Tp	1,3,5-triformylphloroglucinol
Tz	1,3,5-tris(4-formyl-phenyl) triazine
VOPs	Volatile organic pollutants
ZIB	Zinc-ion batteries

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