

Catalytic activity of Cu-cysteine coated on Ti₃C₂MXene toward peroxymonosulfate activation for carbamazepine degradation

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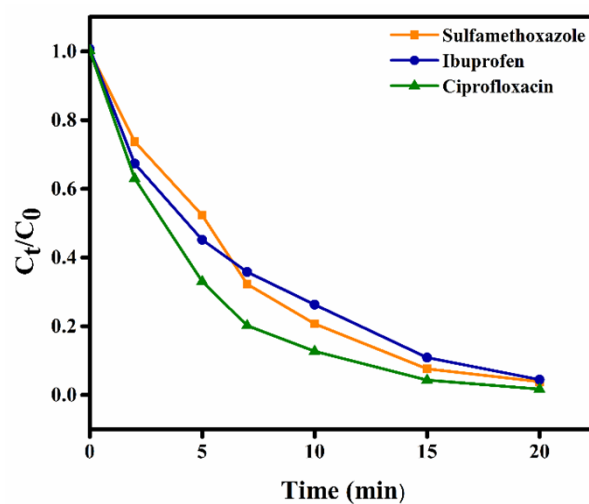


Fig S1: Degradation efficiency of various pharmaceutical pollutants.

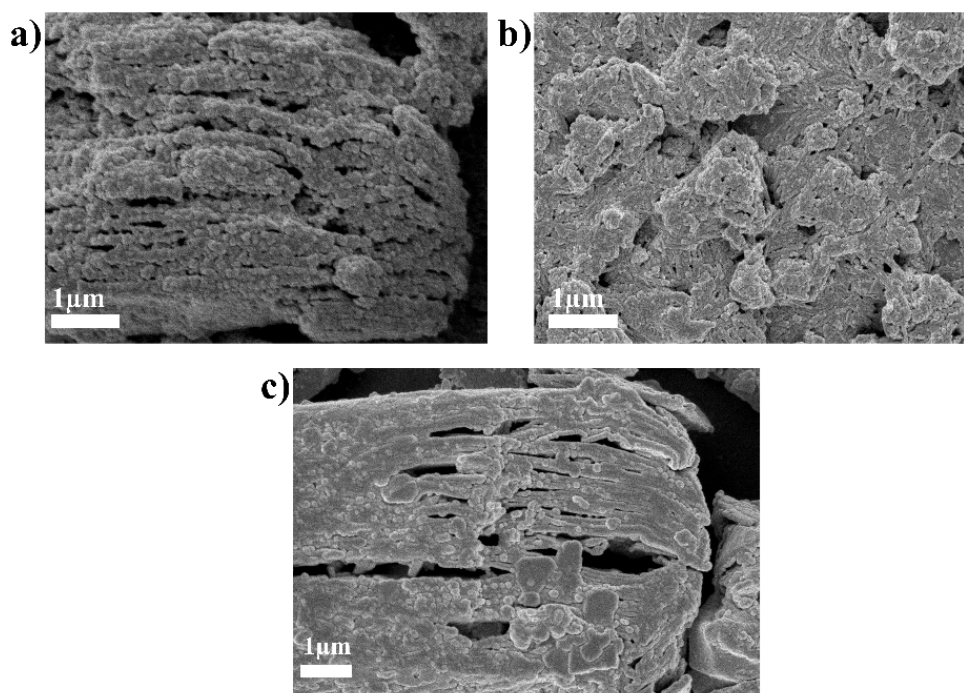


Fig S2. FESEM of the prepared a) Co-cy/MXene, b) Fe-cy/MXene, and c) Mn-cy/MXene.

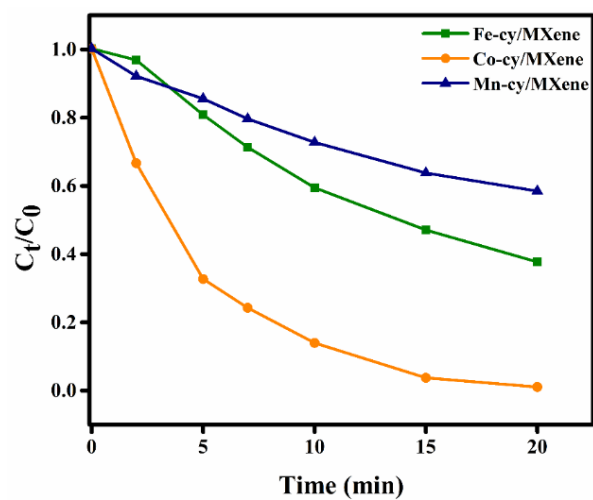


Fig. S3. Removal efficiency of CBZ with different transition metal-cy/MXene catalysts. Reaction conditions: [CBZ] = 10 mg/L, [PMS] = 0.12 g/L, catalyst = 0.2 g/L, pH 7.0.

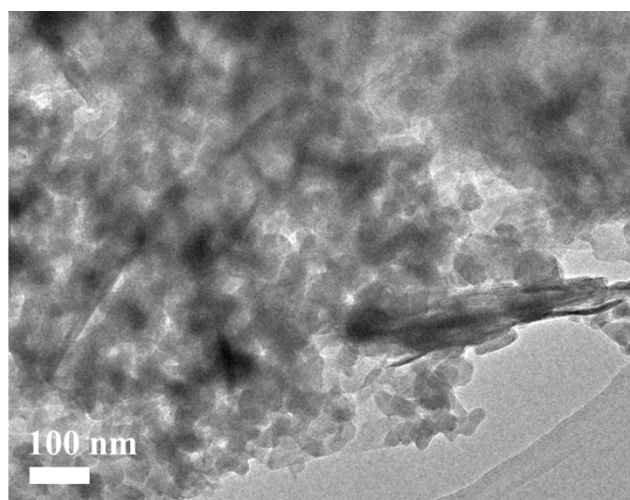


Fig S4. TEM of CCM after four reuse cycles.

Table S1. HPLC conditions for different pollutants

Compounds	Mobile phase	Flow rate (mL/min)	Wavelength (nm)
Carbamazepine	Acetonitrile:60% Water: 40%	1	286
Ibuprofen	Acetonitrile: 40% 0.1% Acetic acid: 60%	0.5	222
Sulfamethoxazole	Methanol: 70% 0.2% Acetic acid: 30%	1	264
Ciprofloxacin	Acetonitrile:40% Water: 60%	1 1	275

Table S2. Comparison of CCM catalyst to activate PMS with other catalysts for the degradation of CBZ.

	CBZ	Degradation efficiency	Time (min)	Catalyst dosage	PMS dosage	pH	Reference
CuO/MXene	10 mg/L	95.88%	20	0.6 g/L	2 mM	7	[1]
CZIF	5 ppm	96.8%	25	0.05 g/L	0.4 mM	5.8	[2]
Co-CA	20 mg/L	95.3%	20	0.1 g/L	0.3 g/L	6.38	[3]
CoSBC	20 mg/L	95.73%	20	0.10 g/L	0.30 g/L	6.38	[4]
AgBr/BiOBr/Fe ₃ O ₄	10 mg/L	96.84%	30	0.30 g/L	1.0 mM		[5]
NMS	5 mg/L	70%	120	0.4 g/L	0.3 g/L	6.5	[6]
FeMATNPc-INA	2.5×10 ⁻⁵ mol/L	98%	40	1 g/L	1.5 mmol/L	7	[7]
CCM	10 mg/l	98.6%	20	0.2 g/L	0.2 mM (0.12g/L)	7	This work

CZIF: ZIF-derived Co, N-doped graphitic carbon

Co-CA: Cobalt-embedded carbon aerogels

CoSBC: CoS_x containing biochar

NMS: Natural manganese sand enriched with oxygen vacancies

FeMATNPc-INA: Monoaminotrinitro iron phthalocyanine connect with isonicotinic acid

CCM: Cu-cysteine/Ti₃C₂MXene

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