

Supporting Information

Facile Synthesis of MXene-Supported Copper oxide Nanocomposite for Catalyzing Decomposition of Ammonium Perchlorate

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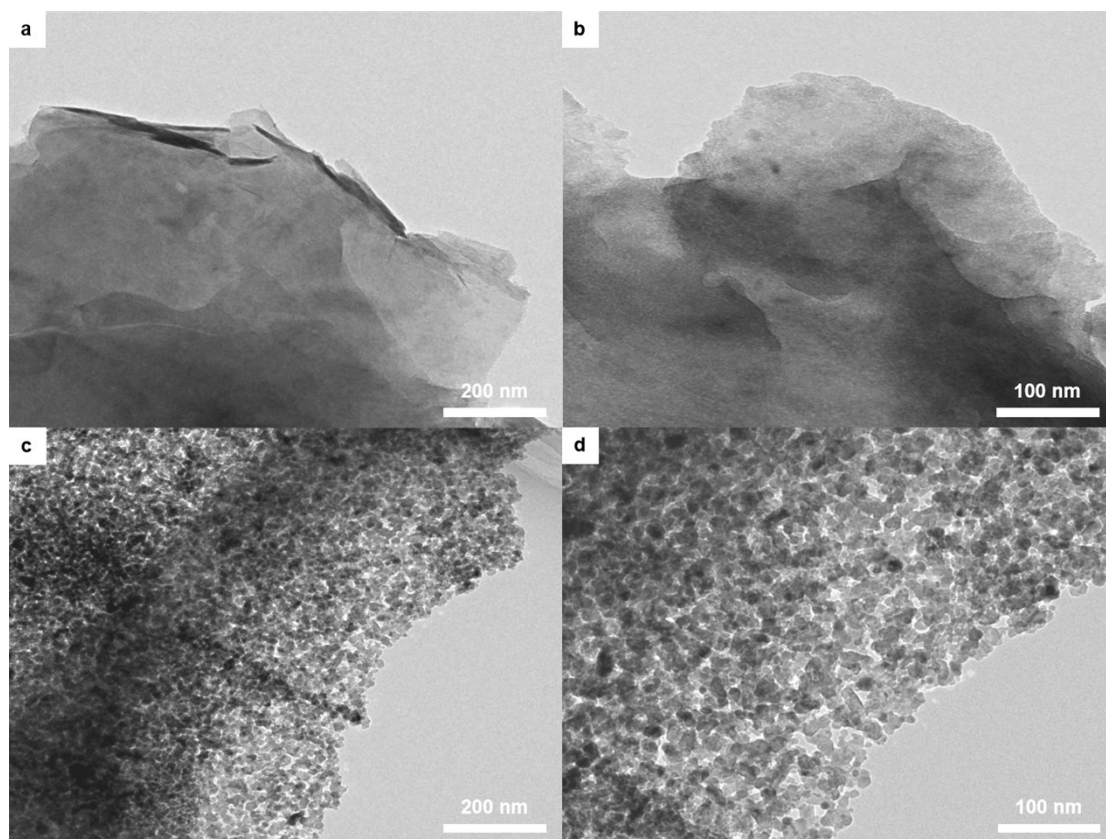


Figure S1. TEM images of pure MXene (a-b) and MCNs-3 (c-d).

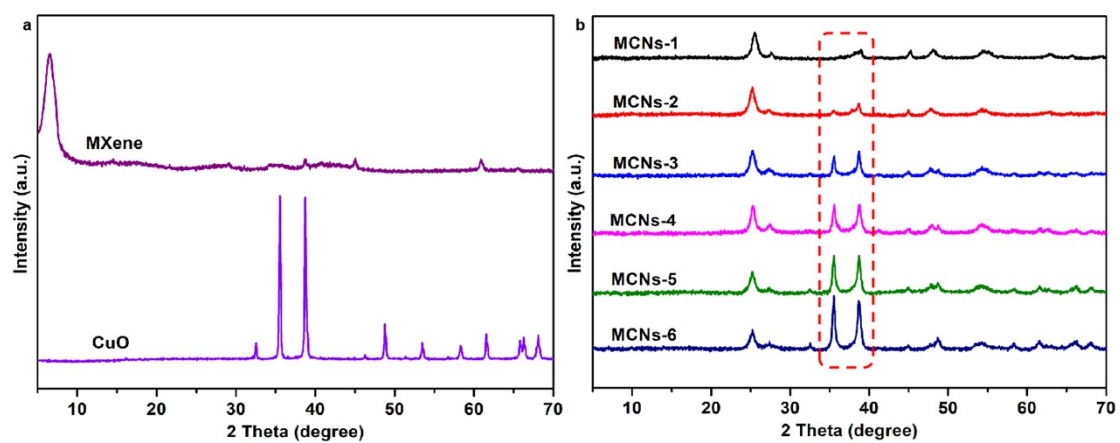


Figure S2. XRD spectra of (a) bare MXene and pure CuO, and (b) MCNs (MCNs-1, MCNs-2, MCNs-3, MCNs-4, MCNs-5, MCNs-6).

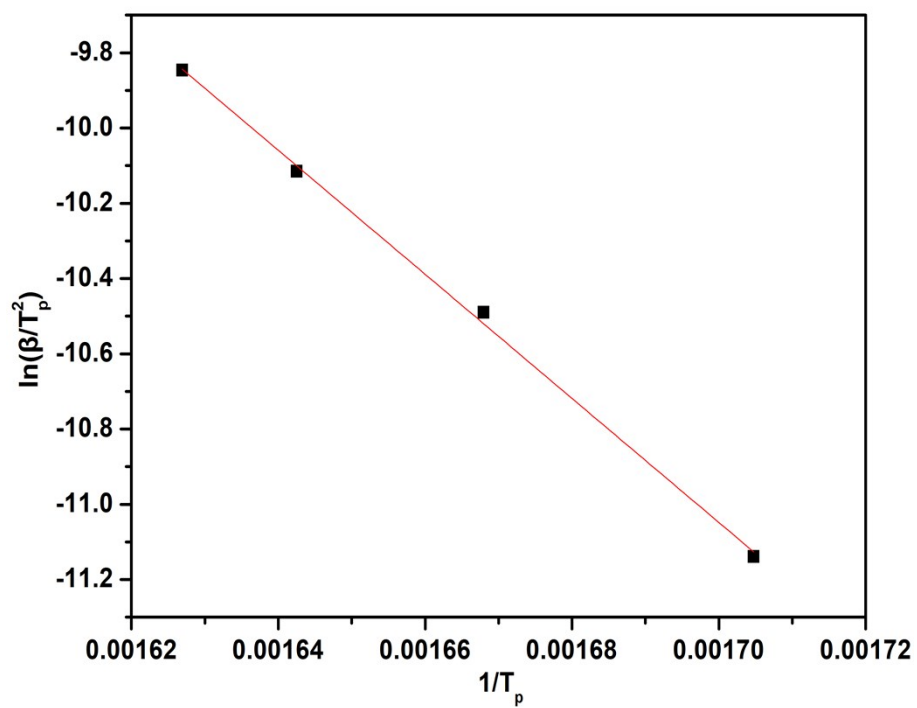


Figure S3. The dependence of $\ln(\beta/T_p^2)$ on $1/T_p$ for AP in the presence of 2 wt% MCNs-3 after Fraser-Suzuki function fitting.

Table S1. Specific surface area and average pore diameter of bare MXene, pure CuO and MCNs.

Sample	Specific surface area/(m ² ·g ⁻¹)	Average pore diameter/nm
MXene	18.3	69.7
CuO	20.1	34.5
MCNs-1	32.9	5.0
MCNs-2	37.2	5.8
MCNs-3	56.1	8.1
MCNs-4	47.2	7.6
MCNs-5	45.5	7.3
MCNs-6	39.9	6.8

Table S2. The kinetic parameters of pure AP and AP in the presence of 2 wt% MCNs-3 by Kissinger Akahira Sunose methods. (T_{HTD} was the Celsius temperature corresponding to T_p)

β (K·min ⁻¹)	Pure AP				AP with 2 wt% MCNs-3			
	T_{HTD} (°C)	T_p (K)	$\ln(\beta/T_p^2)$	$1/T_p$	T_{HTD} (°C)	T_p (K)	$\ln(\beta/T_p^2)$	$1/T_p$
5.0	417.6	690.75	-11.466	0.00145	312.6	585.75	-11.136	0.00171
10.0	425.2	698.35	-10.795	0.00143	324.9	598.05	-10.485	0.00167
15.0	434.1	707.25	-10.415	0.00141	336.9	610.05	-10.119	0.00164
20.0	441.6	714.75	-10.148	0.00140	341.0	614.15	-9.845	0.00163

Table S3. Fitting parameters obtained by peak fitting of experimental DSC curves of AP in the presence of 2 wt% MCNs-3 at the different heating rate.

Parameters	β	a_0	a_1	a_2	a_3	R^2
Process 1	5.0	1.68	566.22	18.57	-0.767	0.984
	10.0	1.98	575.94	19.62	-0.766	0.991
	15.0	3.56	586.76	22.86	-0.766	0.989
	20.0	5.35	598.36	23.65	-0.768	0.981
Process 2	5.0	4.96	586.60	16.01	-0.587	0.984
	10.0	6.40	599.54	17.84	-0.588	0.991
	15.0	9.24	608.83	11.20	-0.588	0.989
	20.0	12.27	614.65	10.86	-0.586	0.981

Table S4. The kinetic parameters of AP in the presence of 2 wt% MCNs-3 by Kissinger Akahira Sunose methods after Fraser-Suzuki function fitting. (T_{HTD} was the celsius temperature corresponding to T_p)

β (K·min ⁻¹)	AP with 2 wt% MCNs-3					
	T_{HTD} (°C)	T_p (K)	$\ln(\beta/T_p^2)$	$1/T_p$	E_a (kJ·mol ⁻¹)	R^2
5.0	313.5	586.65	-11.139	0.00170	137.1	0.997
10.0	326.4	599.55	-10.490	0.00167		
15.0	335.7	608.85	-10.115	0.00164		
20.0	341.5	614.65	-9.846	0.00163		