Supporting information

MnO_2 nanoparticles supported on g-C_3N_4-M for the selective oxidation of cumene to 2-phenyl-2-propanol

Experimental section

Captions for Tables and Figures

Table S1 XPS characterization results of the types and contents of elements in different catalysts.

Entry	Catalysts	C 1s at%	N 1s at%	O 1s at%	Mn 2p at%
1	g-C_3N_4-M	45.22	49.59	5.19	0
2	10-MnO_2/g-C_3N_4-M	43.17	42.22	12.27	2.34
3	30-MnO_2/g-C_3N_4-M	40.18	38.28	16.66	4.88

Table S2 Catalysis performance of various catalysts for the CHP decomposition [a].

Entry	Sample	Decomposition (%)	Selectivity (%)	
				
1	g-C_3N_4-M	10.51	49.60	50.40
2	10-MnO_2/g-C_3N_4-M	51.68	72.20	27.80
3	30-MnO_2/g-C_3N_4-M	85.09	76.31	23.69
4	MnO_2 [b]	69.09	60.36	39.64

[a] Conditions: 60 mg catalyst, 2 mL CHP, 8 mL acetonitrile, 2h, 80◦C. [b] 18 mg catalyst, based on the loading mass of 30-MnO_2/g-C_3N_4-M.

Table S3 Original data for the concentrations of substrate and products catalyzed by g-C_3N_4-M

Temperature (°C)	Time (h)	Concentration (10^{-3}mmol·g^{-1})	Concentration (10^{-5}mmol·g^{-1})	Concentration (10^{-6}mmol·g^{-1})
				
50	0.33	1.247	0.283	5.780
	0.67	1.233	0.258	5.583
	1	1.205	0.345	5.724
	1.33	1.169	0.564	5.575
	1.67	1.125	0.654	5.567
60	0.33	1.455	0.971	1.294
	0.67	1.439	1.122	1.309
	1	1.426	2.166	2.205
	1.33	1.400	1.559	1.587
	1.67	1.378	2.354	2.240
70	0.33	1.403	1.381	2.413
	0.67	1.392	1.608	2.622
	1	1.351	1.585	2.482
	1.33	1.339	2.844	3.618
	1.67	1.181	2.296	2.834
80	0.5	1.758	3.987	5.267
	1	1.444	4.503	4.992
	1.5	1.360	5.394	4.816
	2	1.327	8.876	7.529
	2.5	1.158	8.754	7.228

Table S4 Original data for the concentrations of substrate and products catalyzed by 10-MnO_2/g-C_3N_4-M

Temperature (℃)	Time (h)	Concentration (10^{-3}mmol·g^{-1})	Concentration (10^{-5}mmol·g^{-1})	Concentration (10^{-6}mmol·g^{-1})
				
50	0.33	1.056	0.150	5.554
	0.67	1.039	0.289	5.607
	1	0.994	0.398	5.779
	1.33	0.929	0.784	5.759
	1.67	0.864	1.215	5.966
60	0.33	1.403	0.842	1.789
	0.67	1.373	1.196	2.198
	1	1.337	5.168	8.569
	1.33	1.270	3.520	5.156
	1.67	1.220	5.273	7.257
70	0.33	1.544	3.537	5.783
	0.67	1.479	3.961	5.734
	1	1.435	5.342	7.049
	1.33	1.371	6.107	7.581
	1.67	1.278	4.890	6.038
80	0.5	2.102	15.492	22.855
	1	1.710	24.780	32.475
	1.5	1.616	36.660	43.928
	2	1.492	37.236	38.037
	2.5	1.346	31.331	30.350

Table S5 Original data for the concentrations of substrate and products catalyzed by 30-MnO_2/g-C_3N_4-M

Temperature (℃)	Time (h)	Concentration (10^{-3}mmol·g^{-1})	Concentration (10^{-5}mmol·g^{-1})	Concentration (10^{-6}mmol·g^{-1})
				
50	0.33	1.379	1.486	7.098
	0.67	1.250	2.290	9.587
	1	1.106	2.922	10.736
	1.33	0.951	3.458	12.842
	1.67	0.784	4.956	13.853
60	0.25	1.482	1.549	3.391
	0.58	1.332	1.933	4.041
	0.92	1.279	3.691	7.238
	1.08	1.225	5.138	10.110
	1.25	1.197	6.033	10.843
70	0.33	1.482	1.549	3.391
	0.67	1.332	1.933	4.041
	1	1.279	3.691	7.238
	1.33	1.225	5.138	10.110
	1.67	1.197	6.033	10.843
80	0.5	2.070	9.929	19.501
	1	1.613	15.536	27.369
	1.5	1.541	22.661	38.362
	2	1.393	34.237	57.269
	2.5	1.161	27.350	39.463

Table S6 Cyclic stability test data of 30-MnO_2/g-C_3N_4-M catalyst [a]

Number of reactions	X (%)	Selectivity (%)		
				
1	73.83	9.01	69.61	21.37
2	68.99	12.05	59.06	28.89
3	62.41	16.04	56.83	27.13
4	60.78	18.75	54.16	27.09
5	58.49	19.05	53.86	27.09

[a] Reaction conditions: 60 mg catalyst, 10 mL cumene, 80 °C, O_2 flow 25 mL/min, 8 h

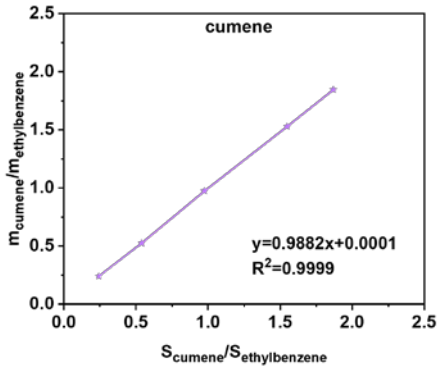

Figure S1 The standard curve of cumene.

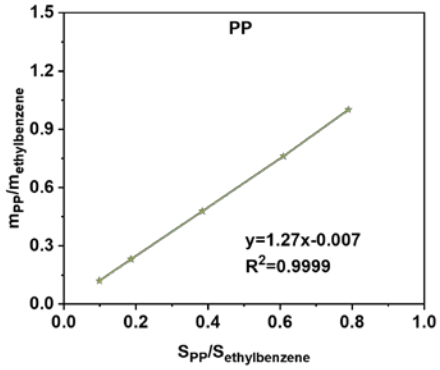

Figure S2 The standard curve of PP.

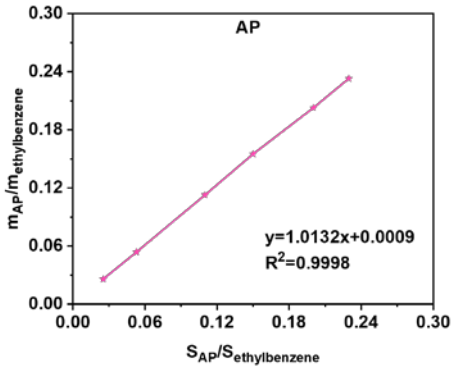

Figure S3 The standard curve of AP.