

TiO₂/Graphene Oxide Modified with Cobalt as a High-Performance Photocatalyst for NO_x and CO removal from air

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Fig. S1

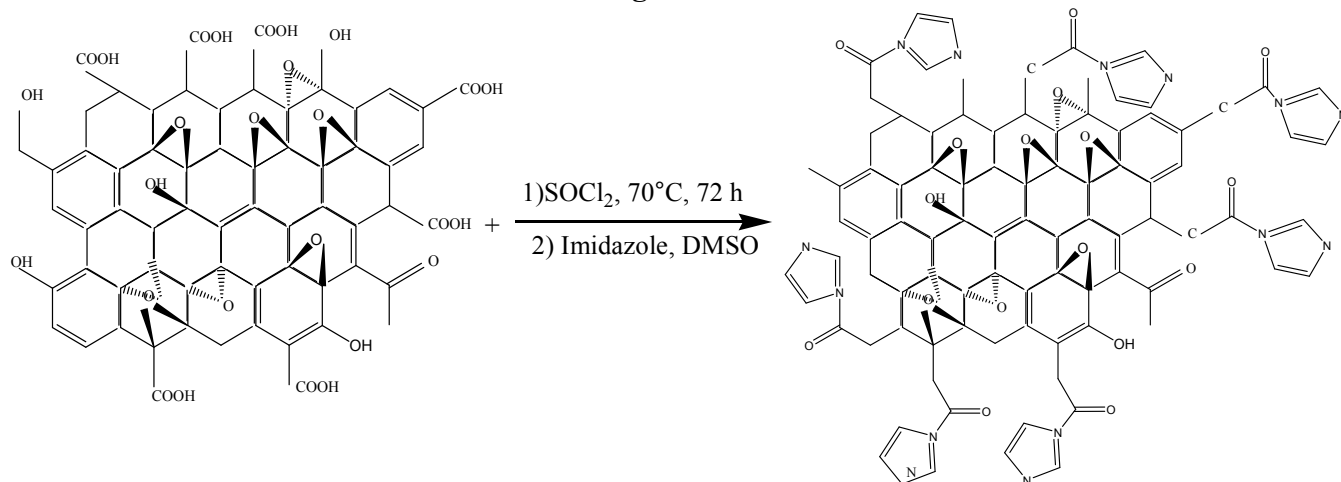


Fig. S1. Functionalization reaction of GO with imidazole

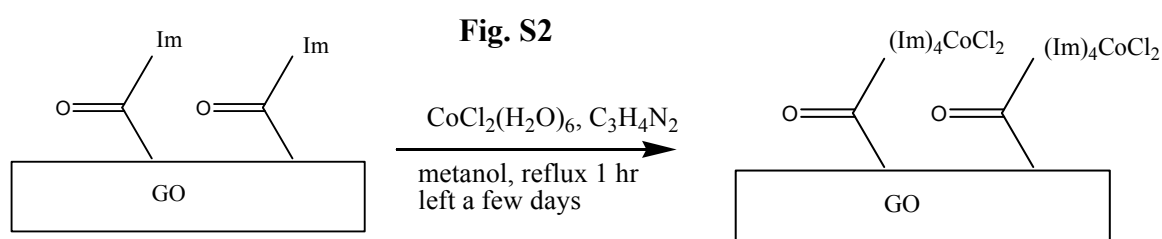


Fig. S2. Schematic diagram of cobalt tetrakis imidazole complex formation at the surface of GO

Fig. S3

Functionalized Graphene Oxide

TiO₂ Thin Film

Quartz Substrate

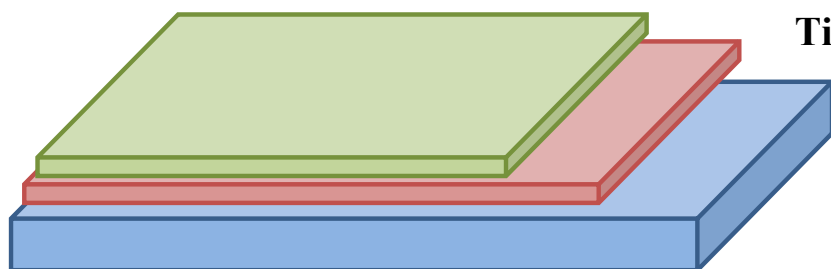


Fig. S3. Schematic layers arrangement of the FGO/TiO₂ composite photocatalyst

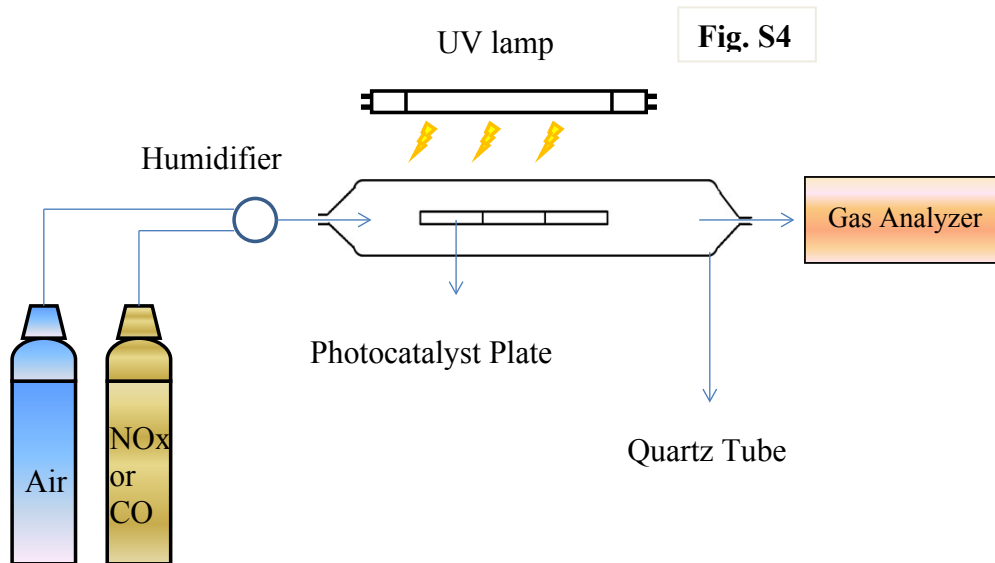


Fig. S4. Schematic laboratory setup of photocatalytic test measurements

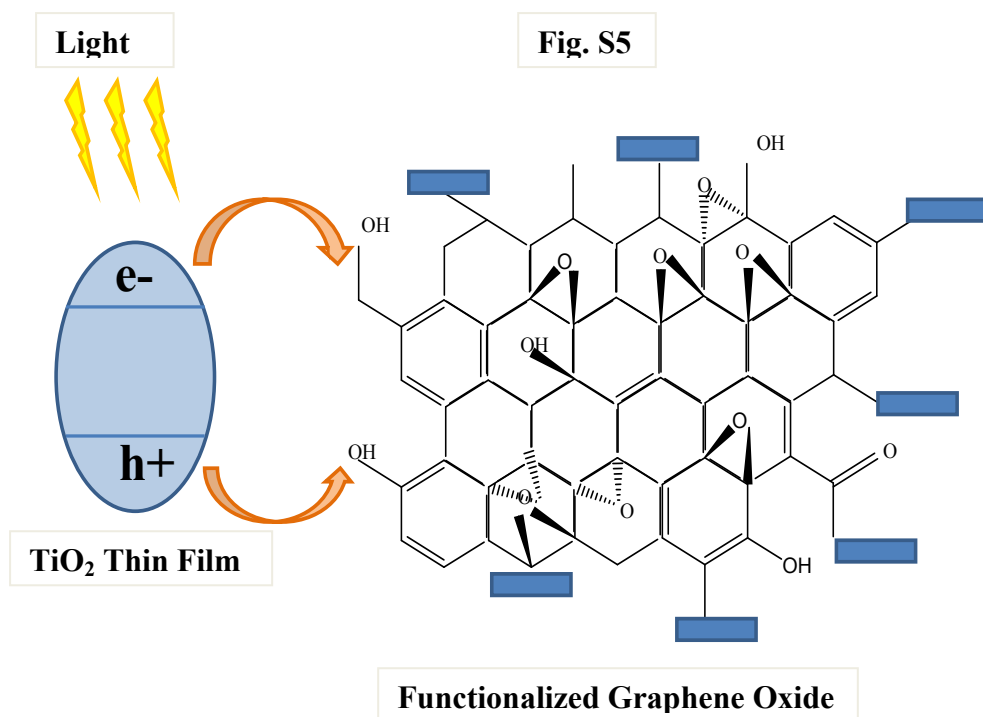


Fig. S5. Schematic effect of FGO on charge separation of the photocatalyst

Table S1.

Time (min)	Series 1	Series 2	Series 3	Series 4	Average	C/C0	C/C0%	SD	RSD
0	998.91	999.58	998.60	997.56	998.66	998.66	0.99	0.84	0.08
10	972.25	971.21	969.54	971.25	971.06	971.06	0.97	1.12	0.12
20	951.01	953.02	952.36	950.51	951.73	951.73	0.95	1.16	0.12
30	932.52	933.68	930.87	932.25	932.33	932.33	0.93	1.15	0.12
40	910.21	909.65	908.45	911.21	909.88	909.88	0.91	1.15	0.13
50	905.25	901.24	902.58	904.03	903.28	903.28	0.90	1.74	0.19
60	890.28	891.47	893.32	894.13	892.30	892.30	0.89	1.75	0.20
70	880.18	882.23	884.12	881.11	881.91	881.91	0.88	1.70	0.19
80	879.15	876.65	877.23	879.78	878.20	878.20	0.88	1.50	0.17
90	871.65	870.21	872.58	869.15	870.90	870.90	0.87	1.52	0.17
100	861.24	863.69	865.59	865.35	863.97	863.97	0.86	2.01	0.23
110	851.21	851.36	852.75	853.98	852.33	852.33	0.85	1.30	0.15
120	841.25	840.15	838.14	837.74	839.32	839.32	0.84	1.66	0.20

Table S2.

Time (min)	Series 1	Series 2	Series 3	Series 4	Average	C/C0	C/C0%	SD	RSD
0	998.89	997.02	998.72	997.98	998.15	998.15	1.00	0.85	0.09
10	952.01	951.31	948.65	947.62	949.90	949.90	0.95	2.10	0.22
20	902.10	901.56	901.27	905.32	902.56	902.56	0.90	1.87	0.21
30	871.23	872.34	874.62	871.23	872.36	872.36	0.87	1.60	0.18
40	862.11	861.28	859.06	858.74	860.30	860.30	0.86	1.65	0.19
50	832.23	831.41	829.78	834.12	831.89	831.89	0.83	1.80	0.22
60	811.15	809.22	810.34	812.30	810.75	810.75	0.81	1.30	0.16
70	782.68	781.66	782.33	778.47	781.29	781.29	0.78	1.92	0.25
80	751.12	752.10	751.03	748.69	750.74	750.74	0.75	1.45	0.19
90	721.09	722.38	720.15	718.55	720.54	720.54	0.72	1.61	0.22
100	702.22	701.36	698.77	699.28	700.41	700.41	0.72	1.65	0.24
110	697.33	698.36	698.70	694.31	697.18	697.18	0.70	2.00	0.29
120	692.01	691.33	690.77	688.02	690.53	690.53	0.69	1.75	0.25

Table S3.

Time (min)	Series 1	Series 2	Series 3	Series 4	Average	C/C0	C/C0%	SD	RSD
0	997.89	998.02	997.72	998.98	998.15	998.15	0.99	0.57	0.06
10	902.22	905.67	901.47	903.99	903.34	903.34	0.90	1.88	0.21
20	850.09	851.77	848.10	852.36	850.58	850.58	0.85	1.91	0.22
30	801.55	802.10	805.21	802.66	802.88	802.88	0.80	1.62	0.20
40	752.89	750.48	750.39	748.30	750.52	750.52	0.75	1.88	0.25
50	702.63	702.99	701.01	704.55	702.80	702.80	0.70	1.45	0.21
60	661.20	662.31	664.77	660.36	662.16	662.16	0.66	1.91	0.29
70	602.32	601.27	600.15	603.85	601.90	601.90	0.60	1.57	0.26
80	551.39	550.09	551.64	552.73	551.46	551.46	0.55	1.08	0.20
90	521.00	518.98	517.44	520.86	519.57	519.57	0.52	1.69	0.33
100	509.02	512.23	511.63	508.61	510.37	510.37	0.51	1.82	0.36
110	501.20	501.63	500.01	498.26	500.28	500.28	0.50	1.51	0.30
120	498.35	499.66	498.22	497.33	498.39	498.39	0.50	0.96	0.19

Table S4.

Time (min)	Series 1	Series 2	Series 3	Series 4	Average	C/C0	C/C0%	SD	RSD
0	50.00	49.85	49.90	49.75	49.88	0.9975	0.99	0.10	0.21
10	49.85	49.20	48.75	48.96	49.19	0.9838	0.98	0.48	0.97
20	49.56	48.96	48.25	49.16	48.98	0.97965	0.98	0.55	1.12
30	48.10	48.15	48.96	47.66	48.22	0.96435	0.96	0.54	1.12
40	48.20	47.56	48.09	47.89	47.94	0.9587	0.96	0.28	0.59
50	48.02	47.55	48.01	47.59	47.79	0.95585	0.95	0.26	0.54
60	47.88	47.55	48.00	47.29	47.68	0.9536	0.95	0.32	0.68
70	47.52	47.45	47.92	47.02	47.48	0.94955	0.95	0.37	0.78
80	47.22	47.30	47.77	46.95	47.31	0.9462	0.95	0.34	0.72
90	47.01	46.71	46.28	46.81	46.70	0.93405	0.93	0.31	0.66
100	46.35	46.25	46.10	45.83	46.13	0.92265	0.92	0.23	0.49
110	45.69	45.88	45.56	45.69	45.71	0.9141	0.91	0.13	0.29
120	45.21	45.63	45.18	45.79	45.45	0.90905	0.91	0.30	0.67

Table S5.

Time (min)	Series 1	Series 2	Series 3	Series 4	Average	C/C0	C/C0%	SD	RSD
0	49.95	49.92	49.80	50.00	49.92	0.9984	0.99	0.09	0.17
10	47.25	48.56	47.56	48.59	47.99	0.9598	0.96	0.69	1.43
20	46.12	45.85	46.23	45.84	46.01	0.9202	0.92	0.20	0.43
30	45.26	45.47	44.56	45.01	45.08	0.9015	0.90	0.39	0.87
40	44.12	44.43	43.12	43.66	43.83	0.8767	0.88	0.57	1.30
50	43.12	42.96	42.63	42.17	42.72	0.8544	0.85	0.42	0.98
60	42.11	41.58	41.96	41.58	41.81	0.8362	0.84	0.27	0.65
70	41.51	41.03	40.82	40.18	40.89	0.8177	0.82	0.55	1.35
80	39.02	40.56	39.33	39.92	39.71	0.7942	0.79	0.68	1.71
90	38.85	39.15	38.59	39.15	38.94	0.7787	0.78	0.27	0.69
100	38.12	38.45	37.81	38.67	38.26	0.7653	0.76	0.38	0.99
110	37.52	37.61	37.29	38.09	37.63	0.7526	0.75	0.34	0.89
120	37.05	36.82	36.73	37.26	36.97	0.7393	0.74	0.24	0.64

Table S6.

Time (min)	Series 1	Series 2	Series 3	Series 4	Average	C/C0	C/C0%	SD	RSD
0	49.72	49.81	49.31	50.00	49.71	0.9942	0.99	0.29	0.59
10	46.10	46.21	46.23	45.02	45.89	0.9178	0.92	0.58	1.29
20	42.32	41.84	43.66	43.27	42.77	0.8555	0.86	0.84	1.96
30	41.28	41.55	40.99	40.07	40.97	0.8195	0.82	0.64	1.61
40	38.21	38.88	39.63	38.12	38.71	0.7742	0.77	0.70	1.81
50	33.88	35.15	35.62	36.14	35.20	0.7040	0.70	0.97	2.68
60	31.12	31.19	32.55	33.33	32.05	0.6410	0.64	1.08	1.88
70	31.41	29.06	31.17	30.20	30.46	0.6092	0.61	1.07	2.25
80	30.14	28.85	29.47	29.45	29.48	0.5896	0.59	0.53	1.79
90	29.41	27.77	27.33	28.46	28.24	0.5649	0.56	0.91	1.64
100	28.66	27.46	26.22	28.05	27.60	0.5520	0.55	1.04	1.27
110	27.25	27.08	26.55	27.31	27.05	0.5410	0.54	0.35	1.27
120	26.41	26.39	25.84	26.66	26.33	0.5265	0.53	0.35	1.31