Supplementary Information

Visible Light Responsive TiO_2 Photocatalysts for Degradation of Indoor Acetaldehyde

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Experimental

Cleaning method of the dialysis tubing

The dialysis tubing (Spectra/Por® 3, molecular weight cut-off: 3500) was cut into 23 cm length and immersed into 1 L of an aqueous solution containing 1.0 x 10^{-3} mol dm^{-3} ethylenediaminetetraacetic acid and 2% $NaHCO_3$ under stirring at 80ºC for 30 min. After cooling to room temperature, it was washed thoroughly with water. Then, it was immersed in water under stirring at 80ºC for 30 min followed by cooling and washing with water thoroughly.

Table S1. Amounts of metal ions used in the synthesis and those doped in the finally obtained samples.

Additive amount (atom%)	Doped amount of metal ions (atom%)									
	Cr(III)	Pt(IV)	V(III)	Fe(III)	Cu(II)	Nb(V)	Mo(VI)	W(VI)	Mn(II)	Ru(III)
0.10		0.10		0.10					0.01	
0.20	0.20				0.11					
0.30			0.30							
0.50	0.50	0.50	0.50	0.50	0.23	0.50	0.50	0.50	0.20	0.42
0.80	0.80									
1.0		1.0	1.0	1.0	0.35	1.0	1.0	1.0	0.30	0.90
2.0	1.7	1.9	1.8		0.70	1.0			0.47	1.8
5.0	2.9									
10	4.2									

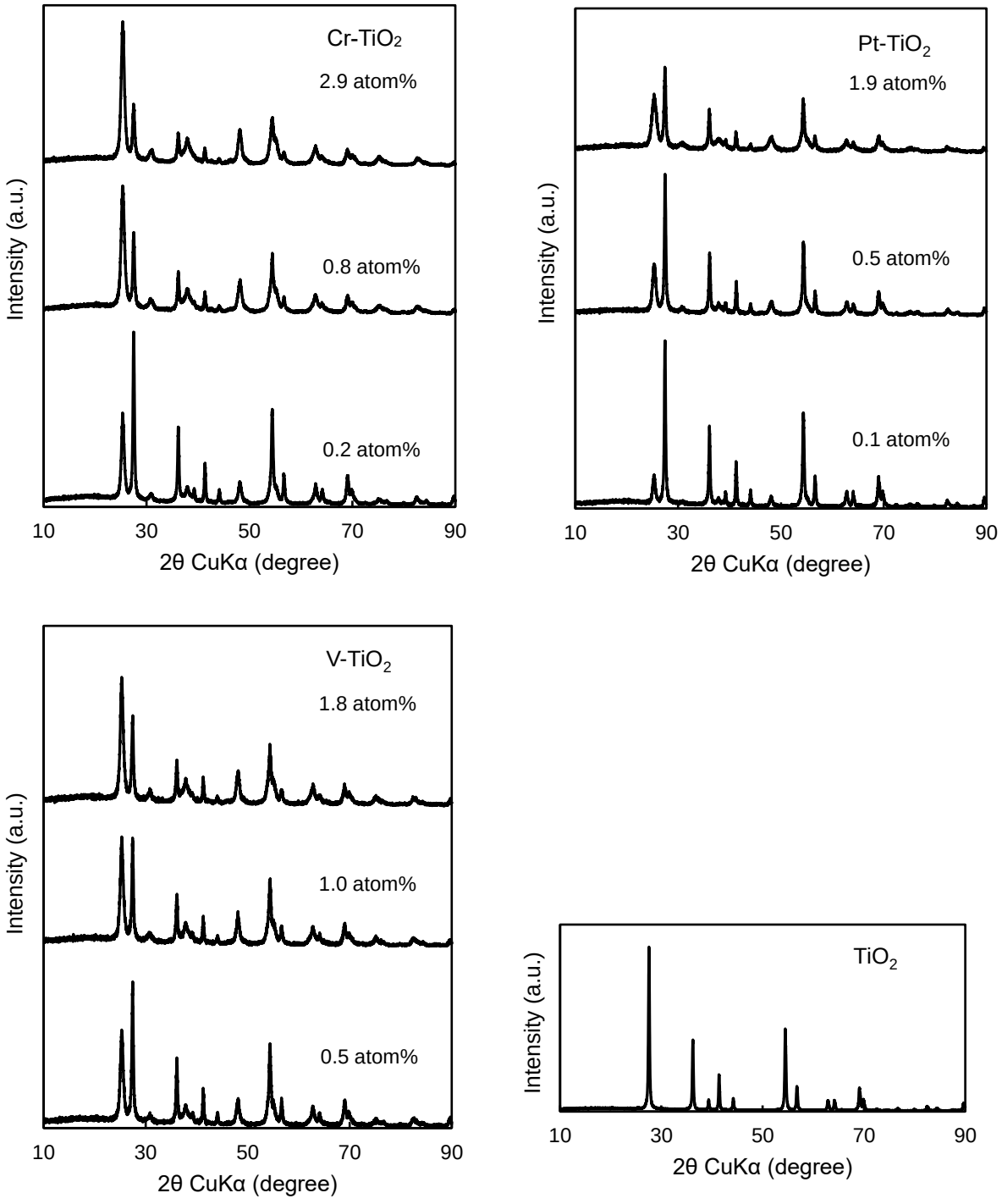

Figure S1. XRD patterns of Cr-TiO_2, Pt-TiO_2, V-TiO_2 and TiO_2 powder sintered at 500 °C.

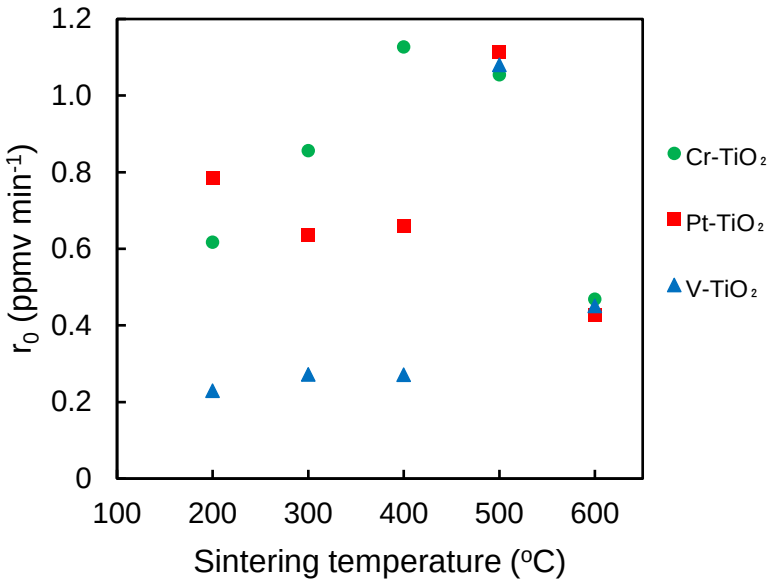

Figure S2. Effect of sintering temperature on the r_0 values for 0.8 atom% Cr-TiO_2, 0.1 atom% Pt-TiO_2, and 1.0 atom% V-TiO_2.

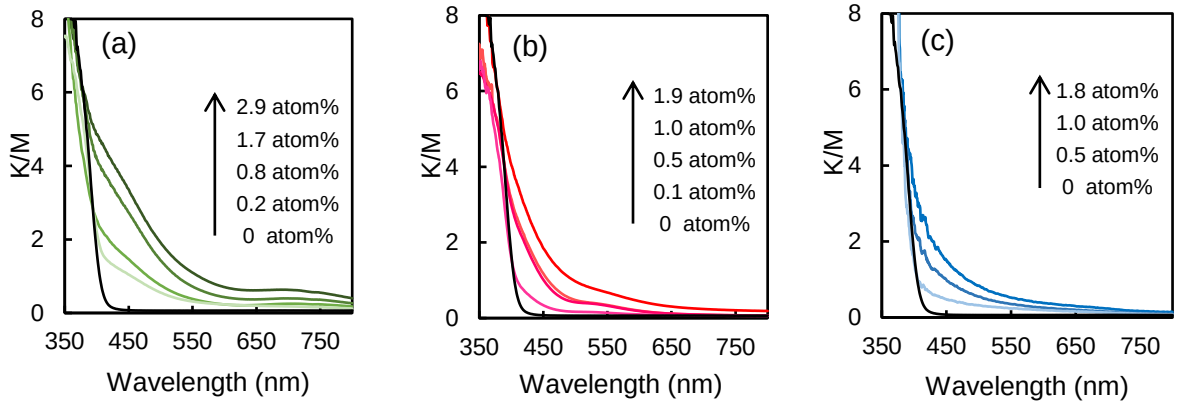

Figure S3. UV-vis diffuse reflectance spectra of (a) Cr-TiO_2, (b) Pt-TiO_2, and (c) V-TiO_2 powder sintered at 500 °C. Black line (0 atom%) shows the spectra of TiO_2.

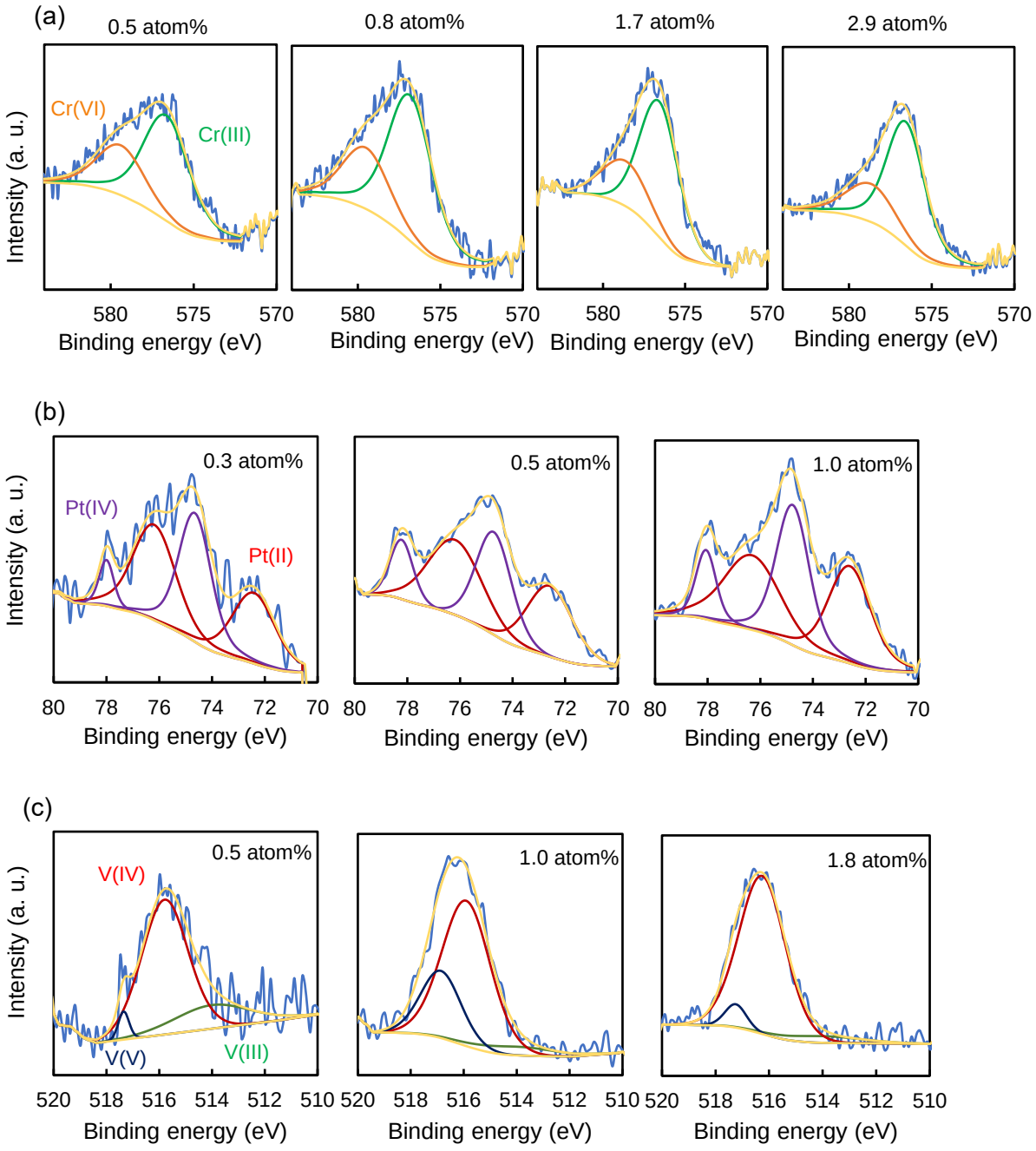

Figure S4. XPS spectra of (a) Cr-TiO_2, (b) Pt-TiO_2, and (c) V-TiO_2 powder sintered at 500°C.

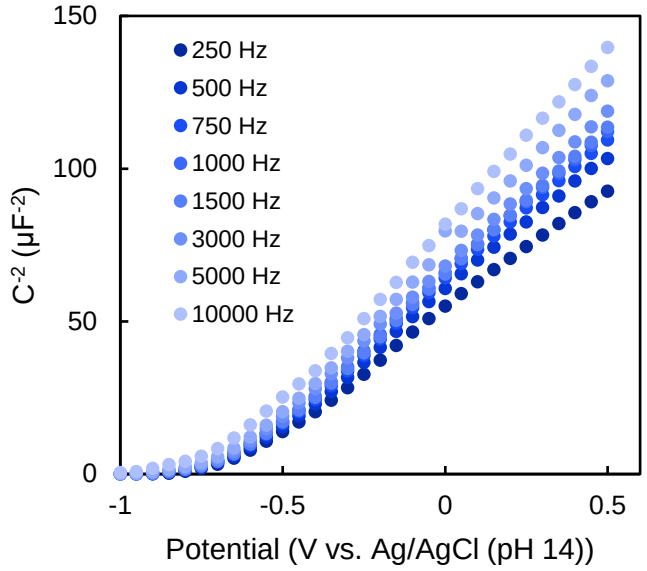

Figure S5. Mott-Schottky plots of TiO_2-DC film at different frequencies (250 – 10000 Hz).

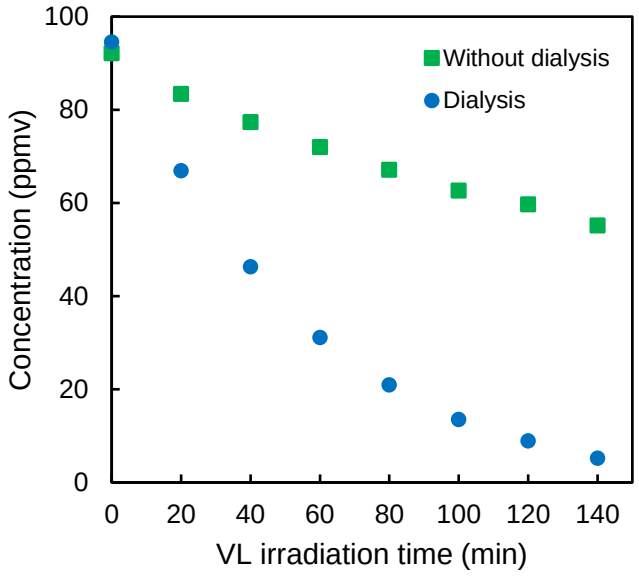

Figure S6. Photocatalytic degradation of CH_3CHO on 0.8 atom% Cr-TiO_2 synthesized with and without dialysis.

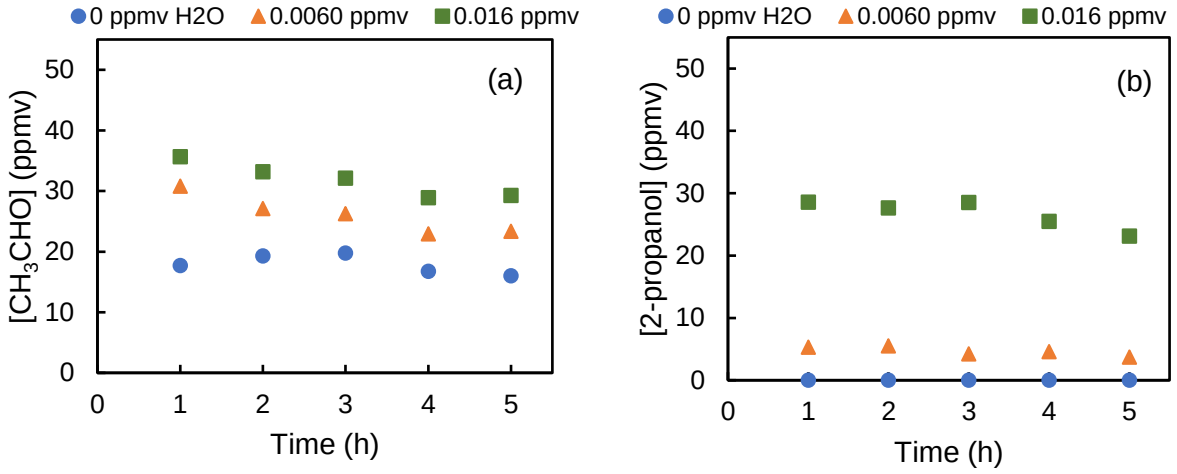

Figure S7. Time course of the concentrations of (a) CH_3CHO and (b) 2-propanol in the reaction vessel containing 0.8 atom% Cr-TiO_2 and various amounts of water vapor.