Supporting information

A near-infrared driven Ti_2O_3-TiO_2-based photoelectrochemical sensor for detecting ascorbic acid based on the principle of photocurrent polarity reversal

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Supplementary Figures

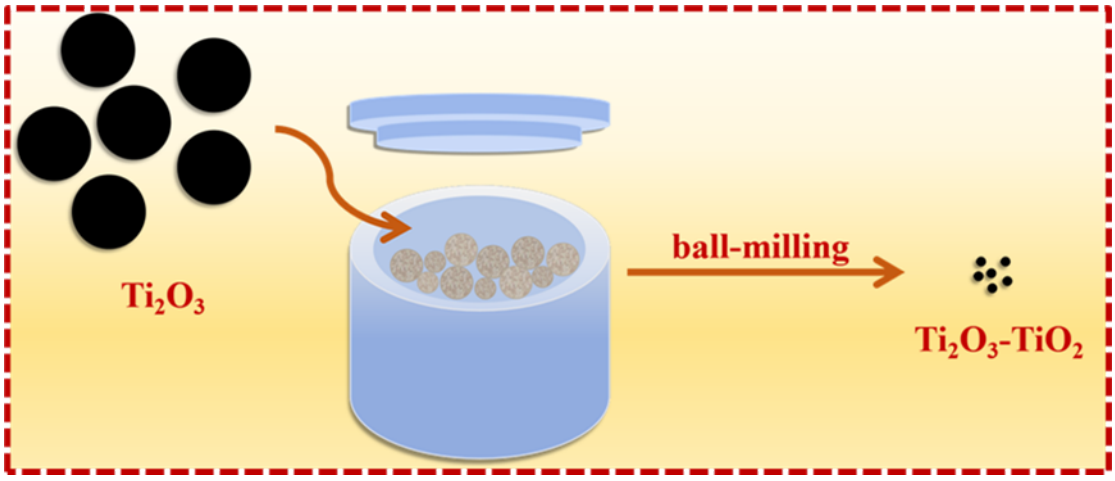


Figure S1. Using ball milling method to make Ti_2O_3-TiO_2

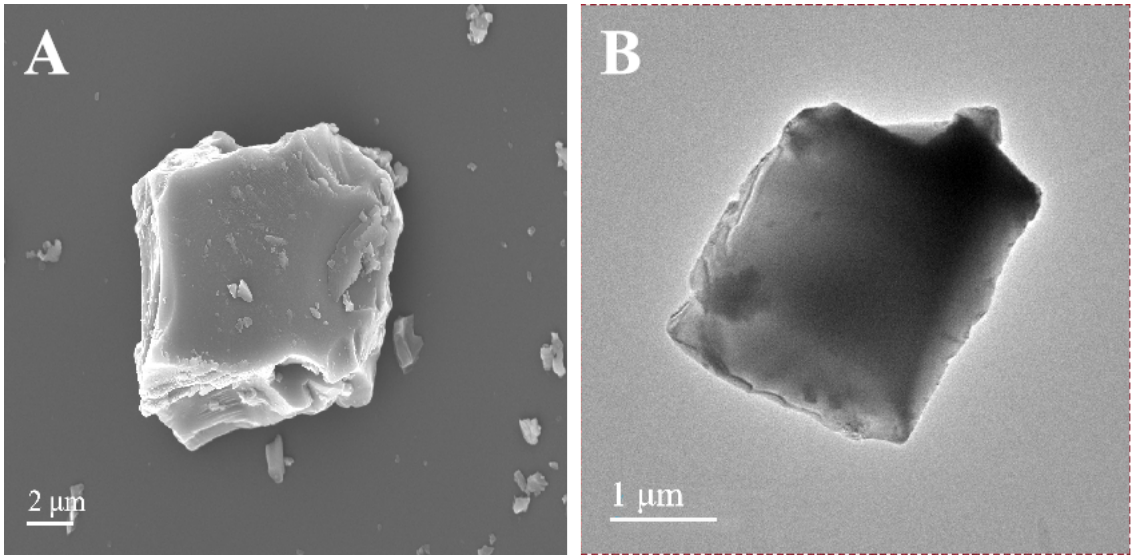


Figure S2. (A) SEM and (B) TEM images of Ti_2O_3

Table S1. XPS high-resolution spectra peak information of Ti_2O_3-TiO_2 Ti 2p

Peak	BE (eV)	FWHM (eV)	Proportion (CPS.eV)	Atomic (%)
Ti^{3+}	457.18	1.77	44029.38	62.13
Ti^{3+}	462.88	2.42	21530.36	30.51
TiO_2	469.38	2.71	5170.04	7.36

Table S2. XPS high-resolution spectra peak information of Ti_2O_3-TiO_2+AA Ti 2p

Peak	BE (eV)	FWHM (eV)	Proportion (CPS.eV)	Atomic (%)
Ti^{3+}	457.44	1.74	64157.87	64.02
Ti^{3+}	463.08	2.40	32622.82	32.69
TiO_2	469.96	1.97	3267.77	3.20

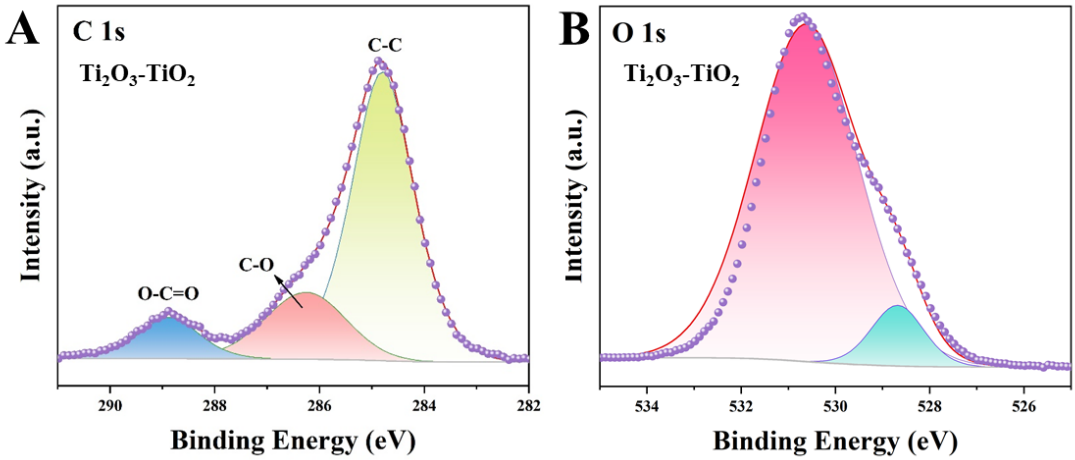


Figure S3. XPS high-resolution spectra of Ti_2O_3-TiO_2: (A) C 1s and (B) O 1s

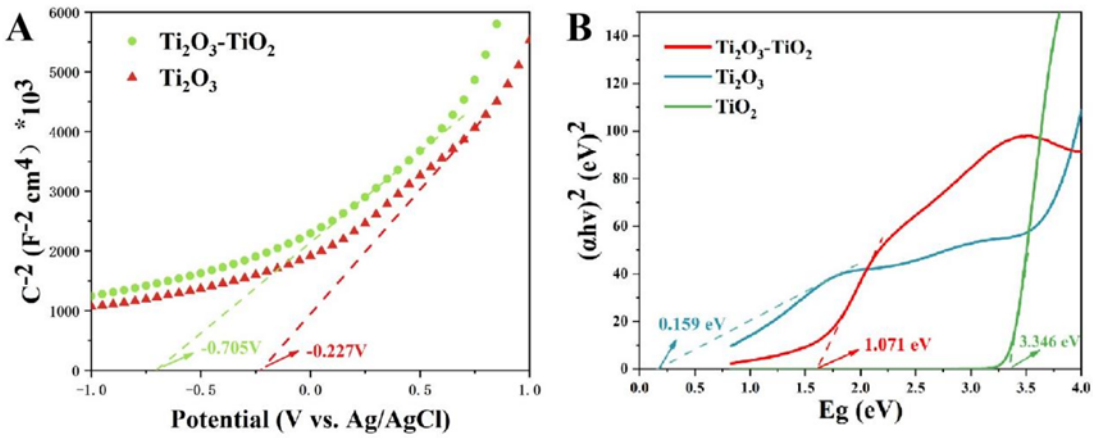


Figure S4. (A) Mott-Schottky plots of Ti_2O_3-TiO_2 and Ti_2O_3. (B) Tauc plots of Ti_2O_3-TiO_2, Ti_2O_3 and TiO_2

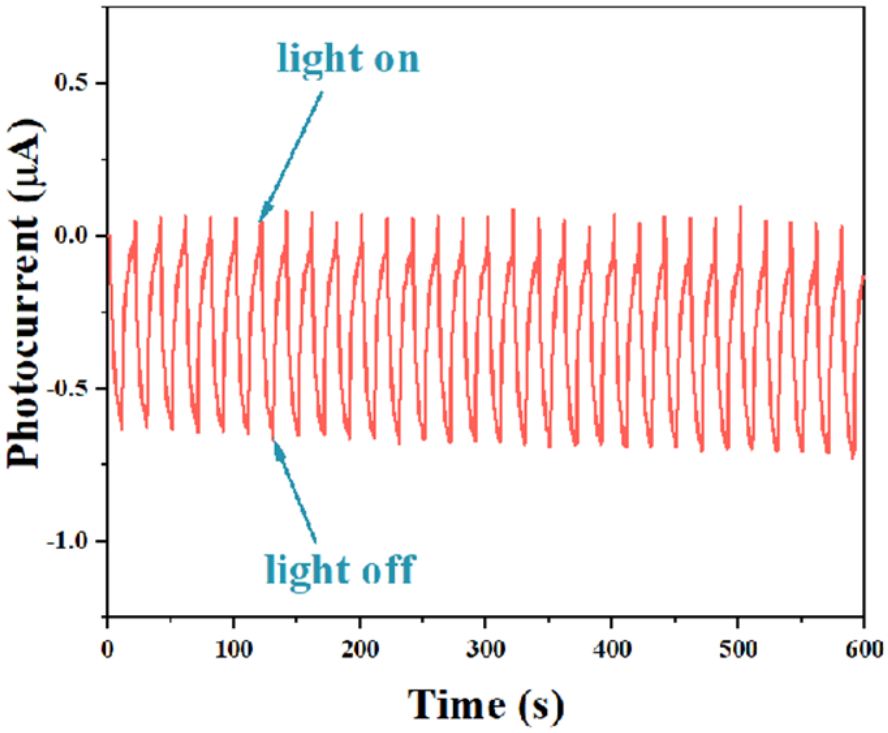
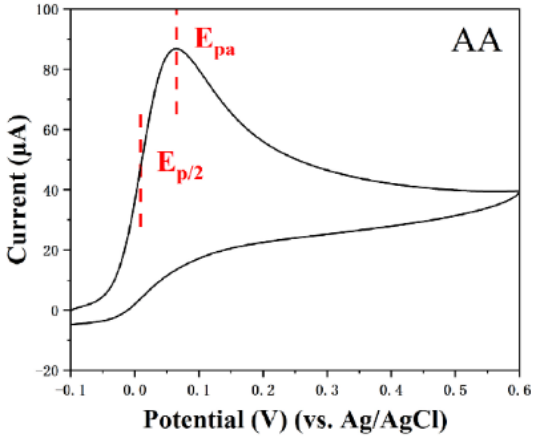
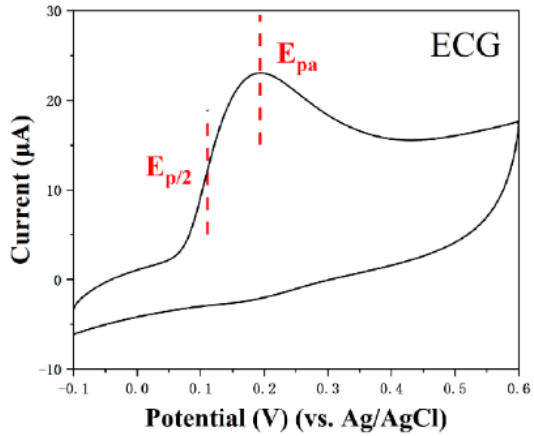
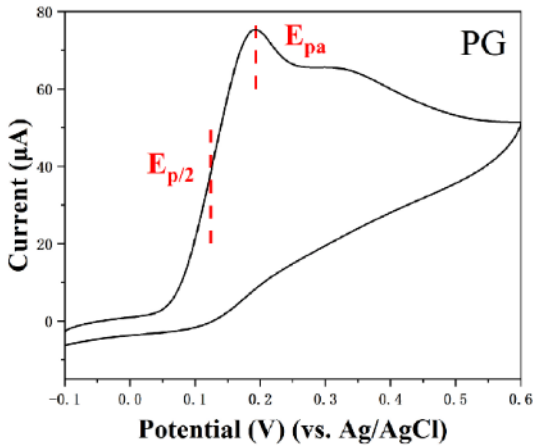
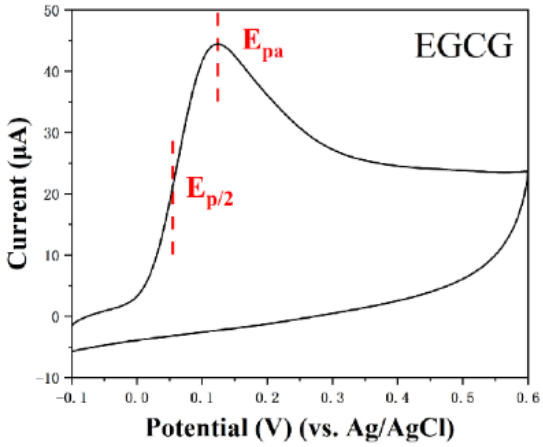
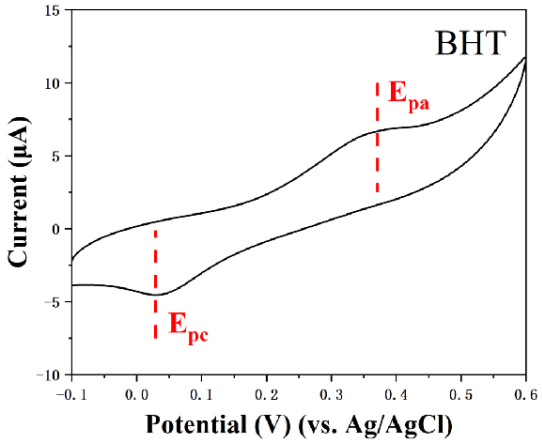
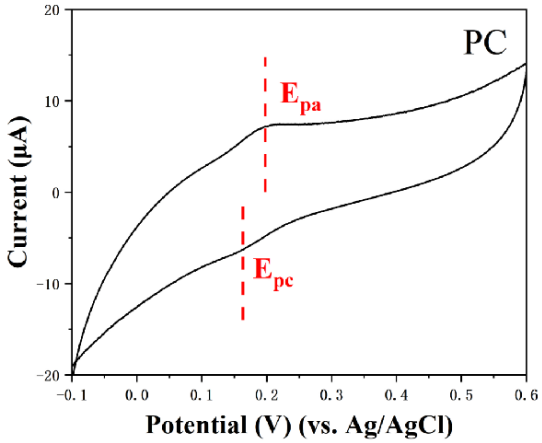
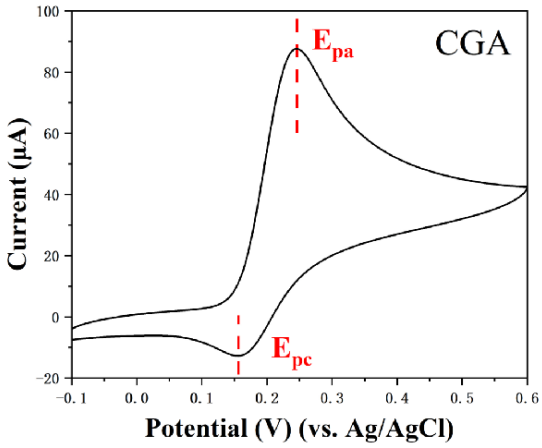


Figure S5. Photocurrent response of Ti_2O_3-TiO_2-based sensors at 0 V under 980 nm near-infrared light irradiation stability after adding 30.5 μM AA.

Table S3. Cyclic voltammogram and redox potential of seven types of antioxidants

Antioxidants	Cyclic voltammogram	Redox potential (V) (vs. NHE)
AA		0.262

ECG		0.568
PG		0.443
EGCG		0.392
BHT		0.321

PC		0.359
CGA		0.390