

Fig.S1 Dependence of voltammetric charge  $q^*$  on the composition of Ti/ $\text{IrO}_2$ - $\text{Ta}_2\text{O}_5$  anodes tested in  $0.5\text{mol}\cdot\text{L}^{-1}$   $\text{H}_2\text{SO}_4$  solution at a sweeping rate of  $20\text{mV}\cdot\text{s}^{-1}$

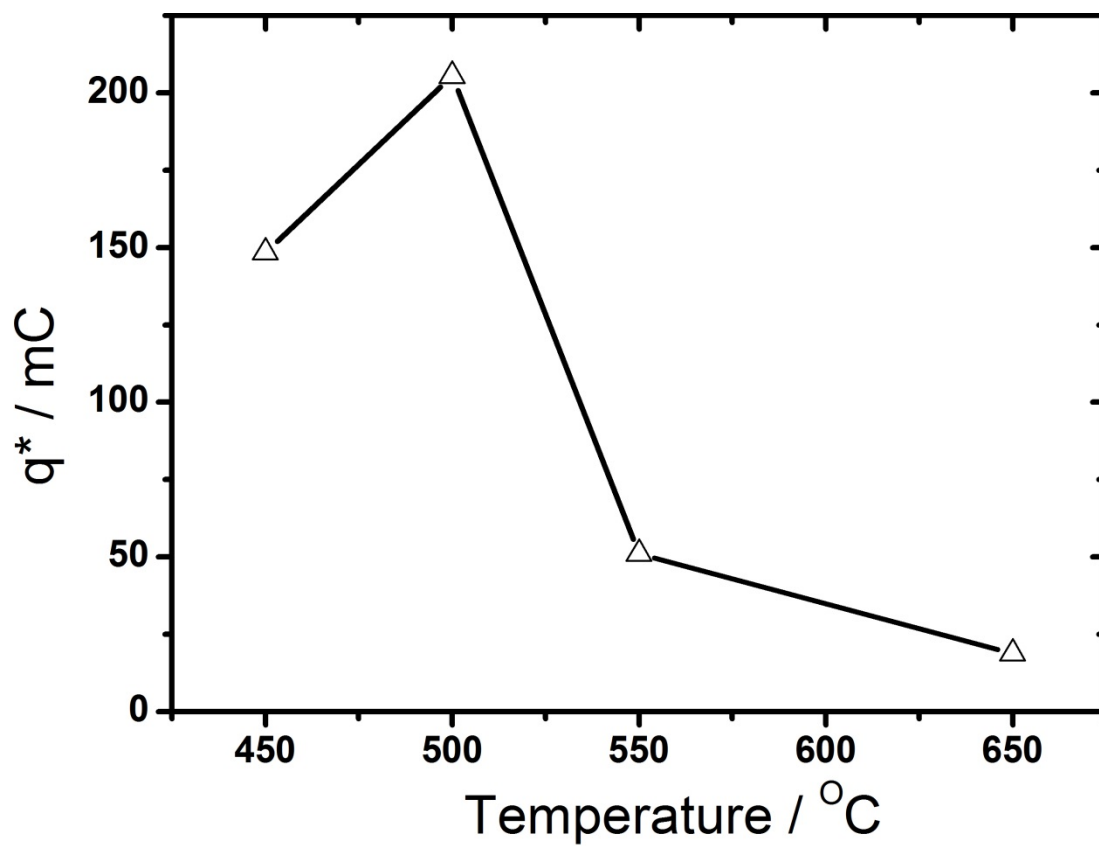


Fig.S2 Dependence of voltammetric charge  $q^*$  on the preparation temperature of Ti/IrO<sub>2</sub>-Ta<sub>2</sub>O<sub>5</sub> anodes tested in 0.5mol·L<sup>-1</sup> H<sub>2</sub>SO<sub>4</sub> solution at a sweeping rate of 20mV·s<sup>-1</sup>

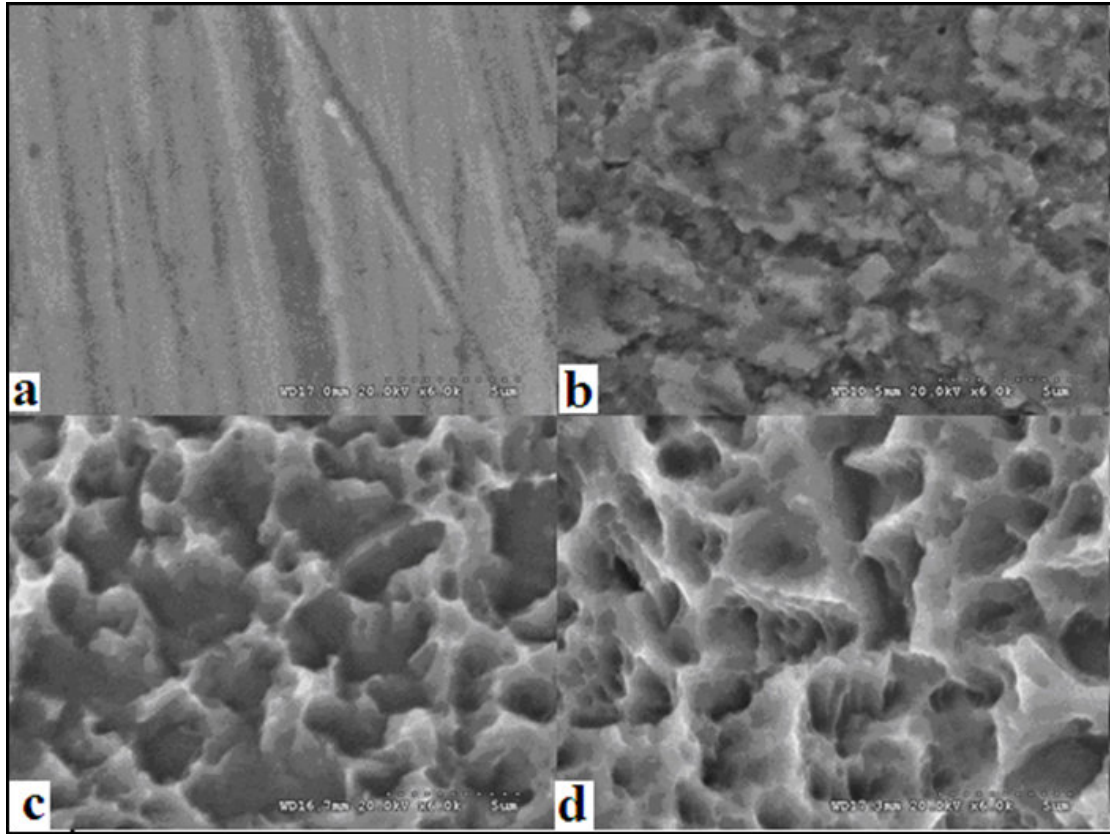


Fig.S3 SEM micrographs for Ti substrate with different activation time (a) 0min, (b) 10min, (c) 40min, (d) 60min

**Table S1** The physicochemical property of EO water prepared by different anode materials

Anode materials	Current density /mA·cm <sup>-2</sup>	Physicochemical property of EOW		
		pH	ORP/mV	ACC/mg·L <sup>-1</sup>
Pt(electroplate)	40	2.26	1096	4.068
	160	2.03	1118	10.90
IrO <sub>2</sub>	40	2.33	1136	24.41
	160	2.27	1147	93.52
RuO <sub>2</sub>	40	2.39	1136	61.70
	160	2.45	1139	194.4
IrO <sub>2</sub> -Ta <sub>2</sub> O <sub>5</sub>	40	2.36	1141	51.53
	160	2.37	1139	152.6

Note: The electrolyte is 0.05wt% NaCl (50mL). The electrode distance is 2.0cm and the electrolysis time is 30min.

**Table S2** The analysis content of Ti/IrO<sub>2</sub>-Ta<sub>2</sub>O<sub>5</sub> with different IrO<sub>2</sub> content and preparation temperature

No.	Nominal content of IrO <sub>2</sub>	Preparation temperature	XRF Analysis
1	90:10	500	86.615: 13.385
2	70:30	450	74.438:25.562
3	70:30	500	73.026:26.974
4	70:30	550	71.389:28.611
5	70:30	650	72.782:27.218
6	60:40	500	60.323: 39.677
7	40:60	500	51.576:48.424
8	10:90	500	37.743: 62.257

