Supplementary Materials

Figure S1. Commercial photocatalytic water splitting system.

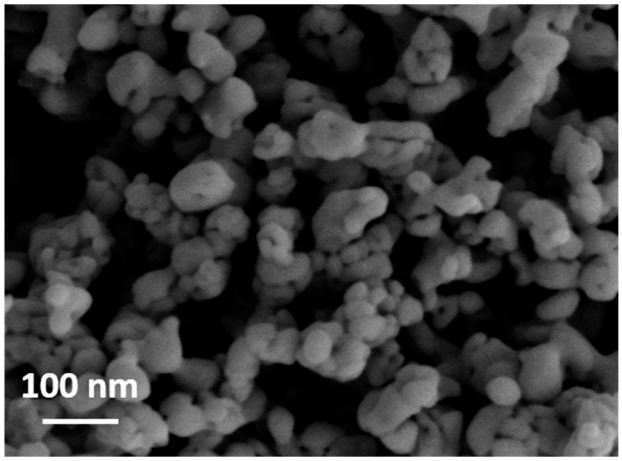

Figure S2. SEM image of (a) the TaON nanoparticles.

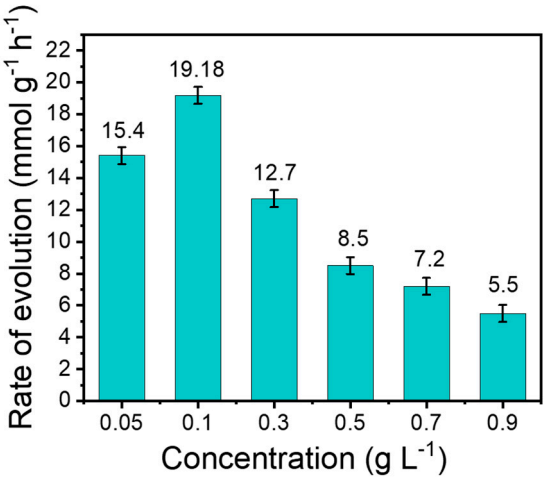

Figure S3. Photocatalytic H_2 evolution rate of the different initial concentrations of the TC4 composites.

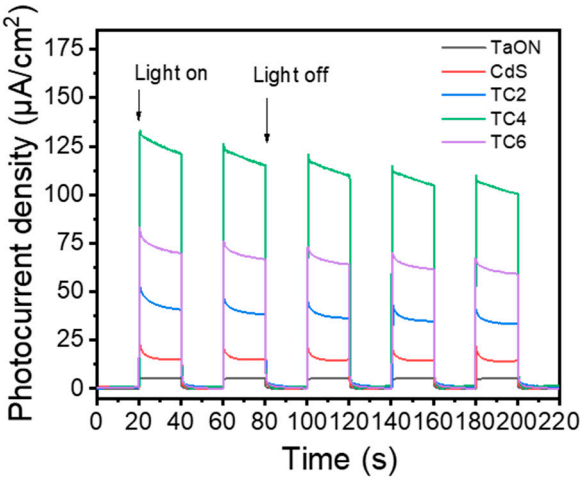

Figure S4. Transient photocurrent responses of pristine TaON, CdS, and the composites samples.

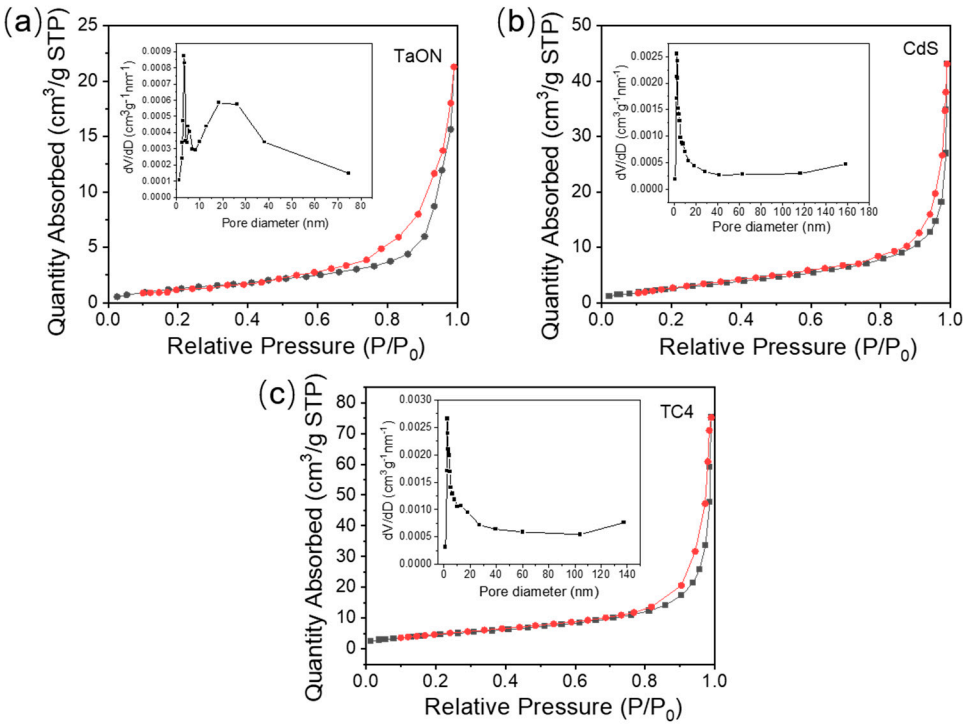

Figure S5. the N_2 sorption isotherm of the (a) the TaON nanospheres; (b) the CdS nanoparticles; (c) the TC4 composites.

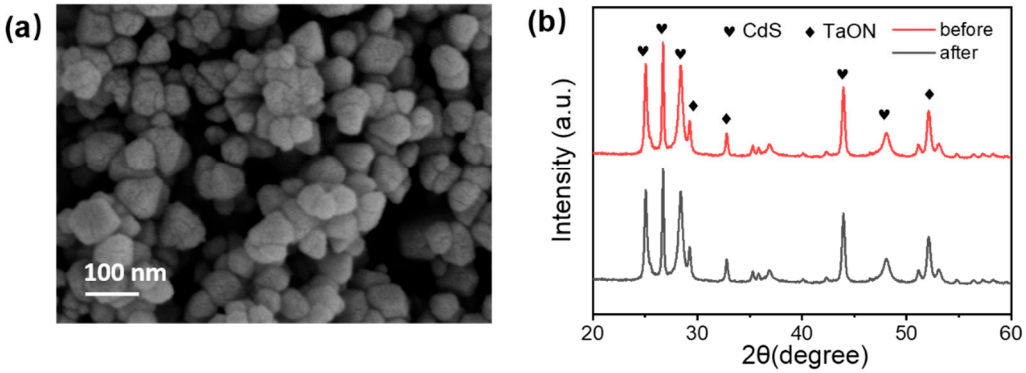

Figure S6. (a) SEM image of TC4 after the cycle stability test; (b) XRD patterns of TC4 before and after the cycle stability test.

Table. S1. The elemental composition of Ta and Cd measured by ICP-AES.

Samples	Ta (wt%)	Cd (wt%)	Ta:Cd (molar ratios)
5 wt% TaON/CdS (TC 1)	4.24	73.3	1:30.2
10 wt% TaON/CdS (TC 2)	7.72	70.5	1:15.1
15 wt% TaON/CdS (TC 3)	11.1	67.7	1:10.0
20 wt% TaON/CdS (TC 4)	14.2	64.2	1:7.6
25 wt% TaON/CdS (TC 5)	17.0	60.8	1:6.4
30 wt% TaON/CdS (TC 6)	19.6	57.4	1:5.2

Table. S2 The surface areas and pore sizes of the CdS nanoparticles, the TaON nanospheres and the TC4 composites.

Samples	Surface areas ($m^2 g^{-1}$)	Pore size (nm)
CdS	10.26	6.5-8.5
TaON	5.22	3.5-5.5
TC4	26.82	5.5-8.5