

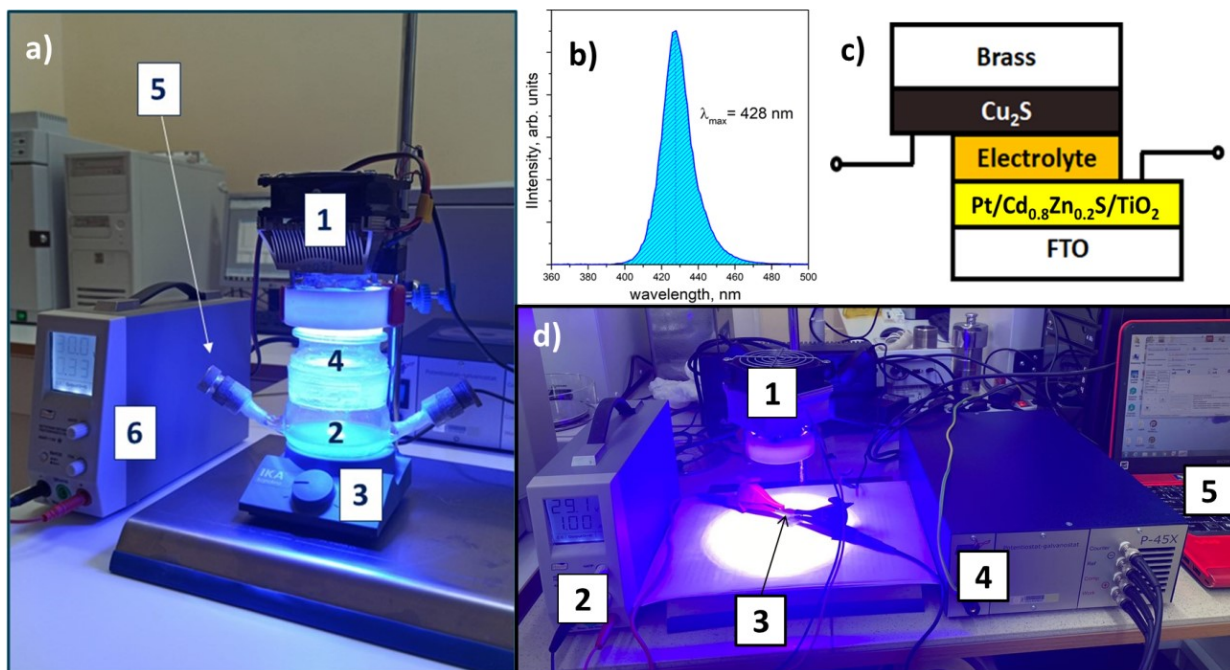
## Supporting Information

### **Composite photocatalysts based on $\text{Cd}_{1-x}\text{Zn}_x\text{S}$ and $\text{TiO}_2$ for hydrogen production under visible light: effect of platinum co-catalyst location**

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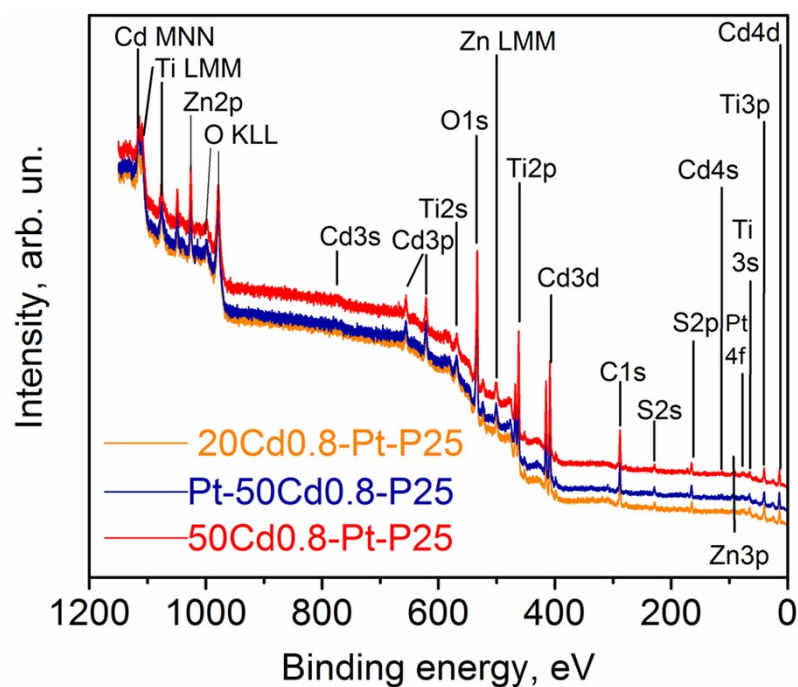
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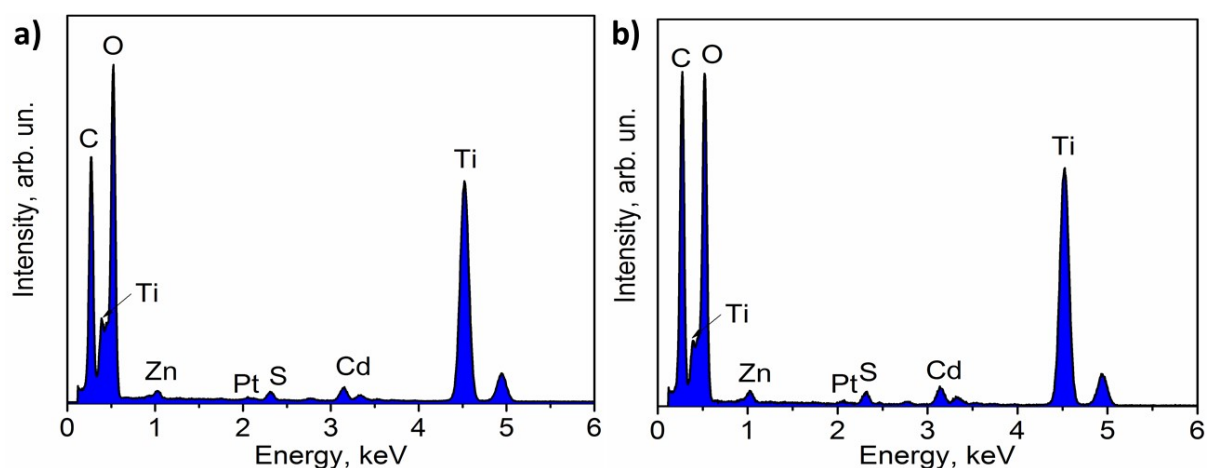
**Figure S1. a) The experimental set-up for the photocatalytic hydrogen production; b) Emission spectrum of 425-LED; c) Scheme of the photoelectrochemical cell; d) Set-up for the studying photoelectrochemical properties.**

**Figure 1a:** The photodiode (1) illuminated the reactor (2) through a quartz window (4). The reaction mixture was stirred with magnetic stirrer (3). The reactor had a sampling port (5) using for analysis of hydrogen amount. The hydrogen concentration was measured by a gas chromatograph “Khromos GKh-1000” (Khromos, Russia). The diode (1) was connected to the power supply (6).

**Figure 1d:** The photodiode (1) connected to the power supply (2) illuminated the photoelectrochemical cell (3). Photoelectrochemical characteristics were obtained with using a potentiostat-galvanostat P-45X (Russia) (4). The obtained experimental data were analyzed by ES8 software (5).

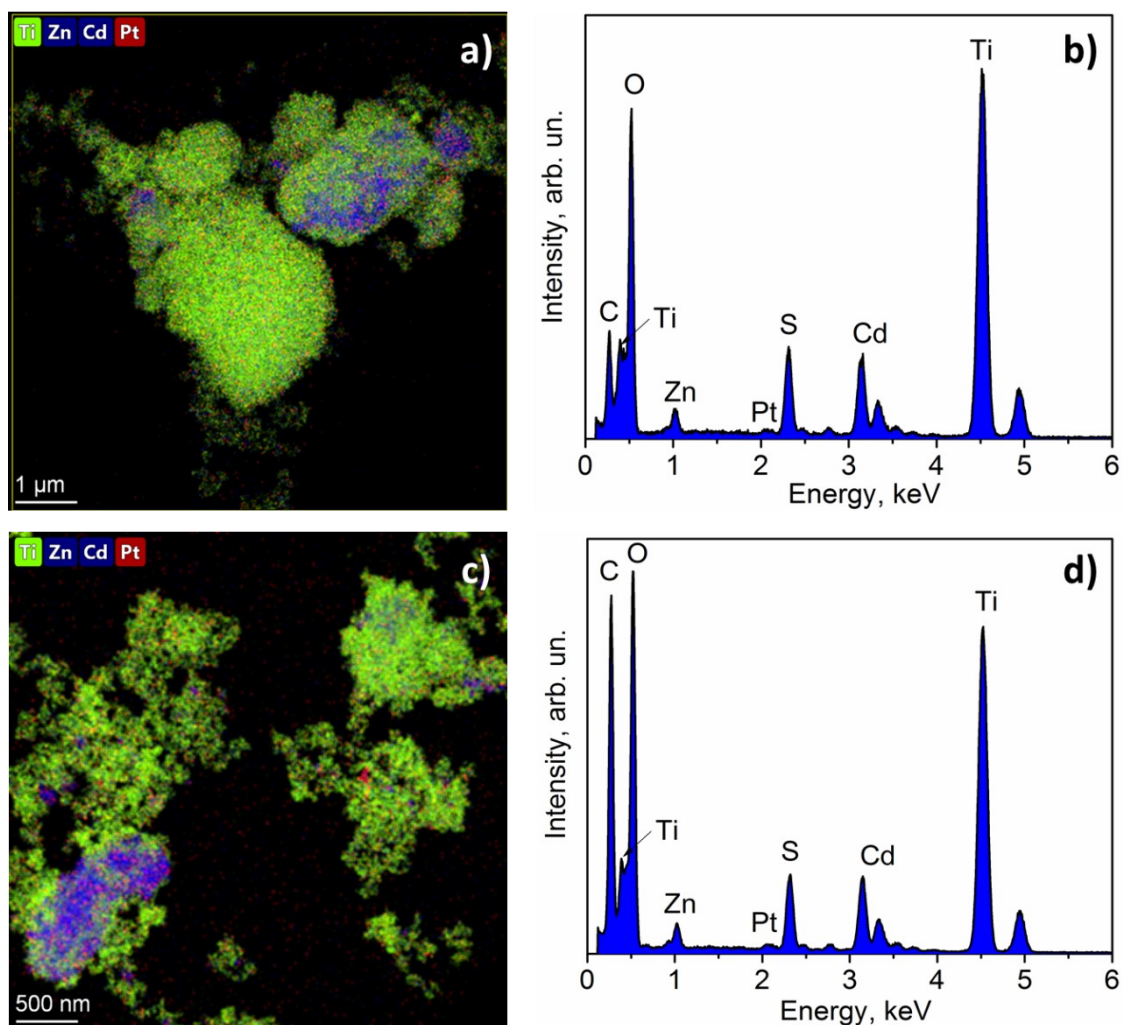


**Figure S2.** Survey XPS spectra of 50Cd0.8-Pt-P25, Pt-50Cd0.8-P25, and Pt-20Cd0.8-P25.



Sample	Weight content of corresponding element, %					
	O	S	Ti	Zn	Cd	Pt
<b>Pt-20Cd0.8-P25</b>	37.94	1.14	54.03	1.00	5.28	0.61
<b>20Cd0.8-Pt-P25</b>	35.16	1.58	54.34	1.60	7.03	0.28

**Figure S3.** EDX spectra of a) location of photocatalyst Pt-20Cd0.8-P25 depicted in Fig. 4d; a) location of photocatalyst 20Cd0.8-Pt-P25 depicted in Fig. 5d. Table shows the numerical data.



Sample	Weight content of corresponding element, %					
	O	S	Ti	Zn	Cd	Pt
<b>Pt-20Cd0.8-P25</b>	19.92	7.32	50.08	3.35	18.77	0.57
<b>20Cd0.8-Pt-P25</b>	25.24	6.94	45.46	3.07	18.41	0.88

**Figure S4. Elemental mapping (a) and EDX spectrum (b) of photocatalyst 20Cd0.8-Pt-P25; Elemental mapping (c) and EDS spectrum (d) of photocatalyst Pt-20Cd0.8-P25. Table shows the numerical data.**