Supporting Information (SI)

Design of nanostructured cadmium tantalate and niobate and their photocatalytic properties

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This information contains the following contents:

Figure S1: XRD patterns of precursor of (a) Cd₂Ta₂O₇ and (b) Cd₂Nb₂O₇ obtained hydrothermally at 180°C for 48h

Figure S2: XRD patterns of cadmium tantalate treated hydrothermally at 180°C for 48h and calcined at 600°C for 8h with different NaOH concentration (a) 0.1M (b) 0.3M and (c) 0.5M

Figure S3: XRD patterns of cadmium niobate treated hydrothermally at 180°C for 48h and calcined at 600°C for 8h with different NaOH concentration (a) 0.1M (b) 0.3M and (c) 0.5M

Figure S4: XRD patterns of cadmium tantalate obtained by hydrothermal method at different temperatures (a) 40°C (b) 80°C (c) 120°C and (d) 180°C for 48h and then calcined at 600°C for 8h (concentration of NaOH, 0.5M)

Figure S5: XRD patterns of cadmium niobate obtained by hydrothermal method at different temperatures (a) 40°C (b) 80°C (c) 120°C and (d) 180°C for 48h and then calcined at 600°C for 8h (concentration of NaOH, 0.5M)

Figure S6: XRD patterns of cadmium tantalate and cadmium niobate synthesized by hydrothermal method at 180°C and calcined at 600°C for 8h at different hydrothermal reaction time (a) 24h and (b) 48h (Concentration of NaOH 0.5M)

Figure S7: XRD patterns of cadmium tantalate treated hydrothermally at 180°C for 48h and calcined at (a) 400°C for 8h (b) 500°C for 8h.

Figure S8: TEM images of (a) cadmium tantalate and (b) cadmium niobate synthesized by hydrothermal method at 180°C for 24h and then calcined at 600°C for 8h.
Figure S9: (a) TEM image of cadmium tantalate after calcining at 800°C (b) TEM image of cadmium niobate after calcining at 800°C (c) TEM-EDX pattern of Cd₂Ta₂O₇ nanocubes and (d) TEM-EDX pattern of Cd₂Nb₂O₇ nanocubes (e) FESEM-EDX pattern of Cd₂Ta₂O₇ nanocubes (f) FESEM-EDX pattern of Cd₂Nb₂O₇ nanocubes (inset magnified image).

Figure S10: TEM images of (a) cadmium tantalate and (b) cadmium niobate synthesized by solid state method.

Figure S11: Photocatalytic degradation of Rhodamine B by Cd₂Ta₂O₇ and Cd₂Nb₂O₇ synthesized by hydrothermal method at 180°C and calcined at 600°C for 8h at (a) pH = 8.5; (Cd₂Ta₂O₇) (b) pH = 8.5 ;(Cd₂Nb₂O₇) (c) pH = 4.5 (Cd₂Ta₂O₇) and (d) pH = 4.5 ;(Cd₂Nb₂O₇) with O₂ purging. [inset:Photocatalytic degradation of Rhodamine B by Cd₂Ta₂O₇ and Cd₂Nb₂O₇ synthesized by hydrothermal method at 180°C and calcined at 600°C for 8h at different reaction time (i) Cd₂Ta₂O₇ (48h), (ii) Cd₂Nb₂O₇ (48h), (iii) Cd₂Ta₂O₇ (24h) and (iv) Cd₂Nb₂O₇ (24h)]

Figure S12: Cycling studies of photodecomposition of (a) Cd₂Ta₂O₇ nanocubes (b) Cd₂Nb₂O₇ nanocubes and (c) TiO₂ commercial under UV light.

Figure S13: XRD patterns of (a) Cd₂Ta₂O₇ nanocubes (b) Cd₂Nb₂O₇ nanocubes before and after photocatalytic reaction.
Figure S2

Figure S3
Figure S4

Figure S5
Figure S6
Figure S7

Figure S8
Figure S9
Figure 10
Figure S11
Figure S12
Before use Cd\textsubscript{2}Ta\textsubscript{2}O\textsubscript{7}  
After use Cd\textsubscript{2}Ta\textsubscript{2}O\textsubscript{7}

Before use Cd\textsubscript{2}Nb\textsubscript{2}O\textsubscript{7}  
After use Cd\textsubscript{2}Nb\textsubscript{2}O\textsubscript{7}

Figure S13