Supporting Information

Construction of PCN/Fe_2O_3/CdS double Z-type heterojunction photocatalyst and its application in the oxidative coupling reaction of benzylamine

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1.Materials

Melamine (TCI, >98%), ferric nitrate nine hydrate ($Fe(NO_3)_3 \cdot 9H_2O$, ACS, 98-101%), ethanol (KESHI, AR), cadmium acetate dihydrate ($Cd(CH_3COO)_2 \cdot 2H_2O$, General-reagent, AR), thioacetamide (TAA, J.T.Baker, AR), ethylenediamine (EDA, General-reagent, AR), acetonitrile (KESHI, AR), benzylamine (Adamas-beta, 98%), 4-chlorobenzylamine (Adamas-beta, 98%), 4-methoxybenzylamine (Adamas-beta, 98%) , 2-thiophenemethylamine (Adamas-beta, 97%+), 2-pyridinemethanamine (Adamas-beta, 99%), furfurylamine (Adamas-beta, 99%), 3-methoxybenzylamine (Adamas-beta, 98%), 2-methoxybenzylamine (Adamas-beta, 98%), 4-methoxybenzylamine (Adamas-beta, 98%), potassium iodide (KI, General-reagent, AR), p-benzoquinone (BQ, Adamas-beta, 99%), isopropanol (IPA, General-reagent, AR), silver nitrate($AgNO_3$, ACS, >99%). All reagents were used without further purification.

2. Preparation of porous g-C_3N_4 (PCN)

Typically, 5 g of melamine was calcined at a heating rate of 5 °C min^{-1} increased to 300 °C under nitrogen atmosphere, and then the nitrogen flow was immediately stopped. The heating rate was constant, and the temperature continued to rise to 550 °C for 4 hours. The product of the collection was porous g-C_3N_4 (PCN). Through the same calcination method, g-C_3N_4 (CN) was prepared without stopping the nitrogen gas.

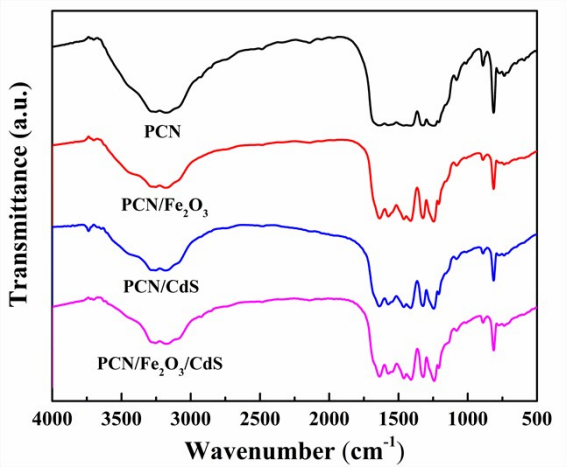

Fig. S1. FT-IR spectrum of samples.

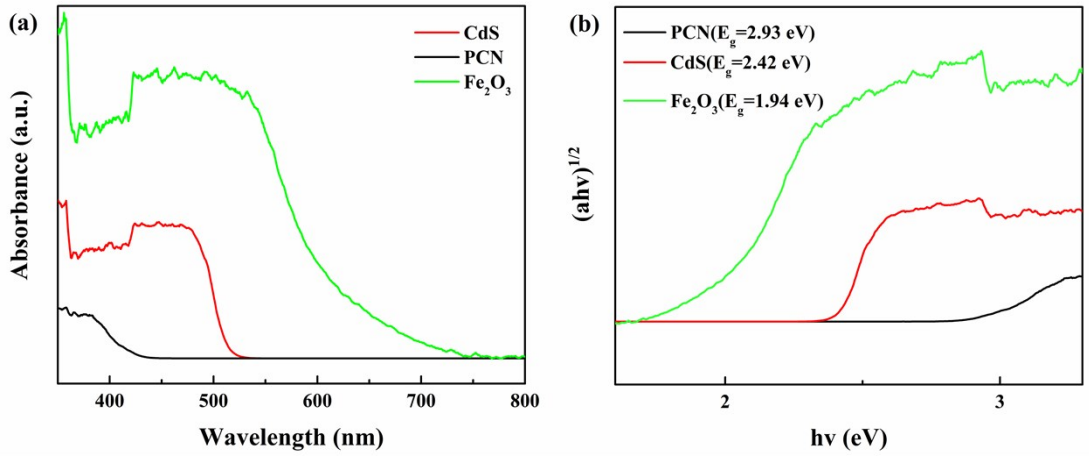

Fig. S2. UV-Vis diffuse reflectance absorption spectrum of PCN, Fe_2O_3 and CdS (a). Band gap energy of PCN, Fe_2O_3 and CdS (b).