Spatially separated cocatalysts on 3D porous g-C_3N_4 for efficient photocatalyst

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Recently, graphitic carbon nitride (g-C_3N_4) have been issued because it is a promising visible-active photocatalyst. However, g-C_3N_4 has low photocatalytic activity due to its low surface area and poor photo-generated charge separation. Herein, we fabricated the 3D porous g-C_3N_4 with spatially separated cocatalyst using fibrous mesoporous silica (KCC-1) as hard template. Due to the highly accessible mesoporous structure of KCC-1, it gives the 3D porous structure which enhance the surface area, light harvesting, and mass transfer. Furthermore, we used Janus surface whereby the reaction of reduction and oxidation sites are spatially separated to prevent internal recombination. The cocatalysts which are consisted by Pt and Co_3O_4 are separately located onto the interior and exterior surface of g-C_3N_4. This system gives an insight to prepare highly efficient photocatalyst both on oxidation and reduction reaction under visible light using highly stable, earth abundant, low cost g-C_3N_4.