**Supplementary information**

**Fig. S1** XRD patterns of TiO2 precursor calcined at different temperatures.



**Fig. S2** EDX spectra of undoped TiO2 precursor (a) and TiO2 precursor with (b) 1.16 (c) 2.01 (d) 3.08 (e) 4.87 and (f) 6.68 % of Fe calcined at 573K.



**Fig. S3** Diffuse reflectance UV-Visible spectra of undoped TiO2 precursor calcined at (a) 773K, (b) 573K and TiO2 doped with (c) 1.16 (d) 2.01 (e) 3.08 (f) 4.87 (g) 6.68% Fe precursor and calcined at 573K.



**Table S1**. Particle size and morphology of photocatalyst.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No.** |  **Sample** | **Particle size****[nm] a** | **Particle size****[nm] b** | **Morphology** |
| **1** |  Pure TiO2 | 16.2 | 15.5 | Spherical |
| **2** | C doped TiO2 | 13.4 | 11.0 | Spherical |
| **4** | C, Fe codoped TiO2 | 10.1 | 7.1 | Spherical |

a Particle size determined from XRD pattern using Debye-Scherrer equation.

b Particle size determined from TEM micrographs.

**Table S2**. Elemental composition of photocatalyst from XPS measurement.

|  |  |  |  |
| --- | --- | --- | --- |
| **No.** |  **Sample** | **Particle size****[nm] a** | **Elemental composition** **(Wt %)b** |
|  |  |  | C | O | Ti | Fe |
| **1** |  Pure TiO2 | 16.2 | 0.00 | 63.87 | 36.13 | 0.00 |
| **2** | C doped TiO2 | 13.4 | 7.71 | 49.93 | 42.36 | 0.00 |
| **3** | C, Fe codoped TiO2  | 12.3 | 3.04 | 50.53 | 45.31 | 1.12 |
| **4** | C, Fe codoped TiO2 | 10.1 | 2.83 | 48.87 | 46.29 | 2.01 |
| **5** | C, Fe codoped TiO2 | 12.1 | 2.85 | 53.04 | 41.07 | 3.04 |
| **6** | C, Fe codoped TiO2 | 13.1 | 3.06 | 46.00 | 46.08 | 4.86 |
| **7** | C, Fe codoped TiO2 | 13.8 | 2.55 | 41.01 | 49.76 | 6.68 |

a Particle size determined from XRD pattern using Debye-Scherrer equation.

b Weight percentage determination by using XPS analysis.