Supplementary Information

$K_2Fe_4O_7$ as heterogeneous photo-Fenton catalyst for highly efficient degradation of dyes

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The preparation method of KFO-80 μm

Firstly, added 4 g ferric nitrate into 32 ml deionized water to form a clarifying solution, 55 g potassium hydroxide was slowly added into ferric nitrate solution with stirring continuously until to become light brown. The mixture was directly added into a Teflon-lined stainless steel autoclave and heated at 180 ^{o}C for 3 hours. After cooling down to room temperature, the precipitation was washed with deionized water for ten times until its pH be neutralized and then dried overnight in a vacuum drying oven at 60 ^{o}C.

The synthesis method of KFO-180 μm

Firstly, added 4 g ferric nitrate into 32 ml deionized water to form a clarifying solution, 64 g potassium hydroxide was slowly added into ferric nitrate solution with stirring continuously until to become dark brown. The mixture was directly added into a Teflon-lined stainless steel autoclave and heated at 240 ^{o}C for 2 days. After cooling down to room temperature, the precipitation was washed with deionized water for ten times until its pH be neutralized and then dried overnight in a vacuum drying oven at 60 ^{o}C.

Reusability and stability performance

After the completion of the photo-Fenton reaction, the suspension was removed from the reaction vessel and washed repeatedly with deionized water and centrifuged. The obtained solid material was dried overnight at 60 ^{o}C in a vacuum drying oven. Four consecutive experiments were tested in 100 mL 0.02 g/L MB solution with 0.03 g $K_2Fe_4O_7$ and 1ml H_2O_2 under visible light irradiation for 35 minutes.

Supplementary Pictures

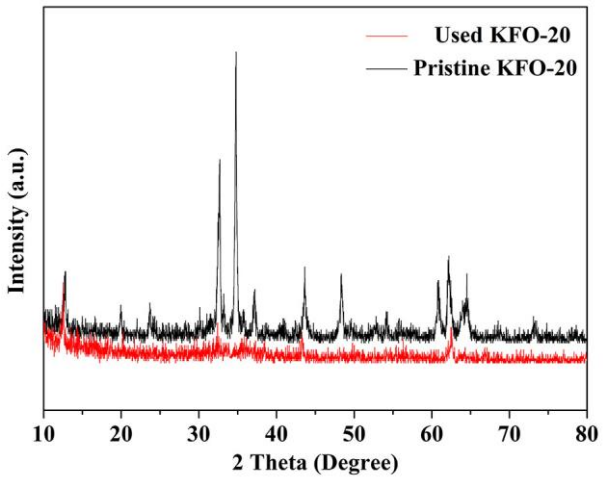

Figure S1. The powder XRD pattern for KFO-20 after used four cycles.