Supplementary Information

Accelerated Fenton degradation for azo dyes wastewater via a novel Z-scheme CoFeN-g-C₃N₄ heterojunction photocatalyst with excellent charge transfer under visible light irradiation

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Fig. S1 Multifunctional photocatalytic reactor.
Fig. S2 TEM images of (a) CN and (b) CFN.

Fig. S3 (a) Full XPS spectra of CFN-CN1, (c) C 1s High-resolution XPS spectrum of CFN-CN1.
Fig. S4 Photos of all samples (a) CN, (b) CFN, (c) CFN-CN1, (d) CFN-CN2 and (e) CFN-CN3.

Fig. S5 EIS Nyquist plot of the catalysts.
Fig. S6 M-S plots vs. Ag/AgCl CFN-CN1.

Fig. S7 Comparison of adsorption performance of different catalysts. Experimental conditions: 
[MO]₀ = 10 mg L⁻¹, [catalyst] = 0.2 g L⁻¹, natural pH.
Fig. S8 Degradation rate constants of MO with different catalysts. Experimental conditions: \([\text{MO}]_0 = 10 \text{ mg L}^{-1}, [\text{catalyst}] = 0.2 \text{ g L}^{-1}, [\text{H}_2\text{O}_2] = 75 \text{ mM}, \text{ natural pH.}\)
Fig. S9 Kinetic analysis curves (a) original MO concentration, (b) catalyst dosage, (c) H$_2$O$_2$ concentration, (d) pH, the illustration in (a), (b), (c) and (d) are the corresponding degradation rate constant. Experimental conditions: [MO]$_0$ = 10 mg L$^{-1}$, [catalyst] = 0.2 g L$^{-1}$, [H$_2$O$_2$] = 75 mM, natural pH.
Fig. S10 Degradation rate constants of different inorganic anions (a) Cl\textsuperscript{-}, (b) HCO\textsubscript{3}\textsuperscript{-} and (c) SO\textsubscript{4}\textsuperscript{2-}. Experimental conditions: [MO]\textsubscript{0} = 10 mg L\textsuperscript{-1}, [catalyst] = 0.2 g L\textsuperscript{-1}, [H\textsubscript{2}O\textsubscript{2}] = 75 mM, natural pH.
Fig. S11 Degradation rate constants for the addition of different active species traps. Experimental conditions: $[\text{MO}]_0 = 10 \text{ mg L}^{-1}$, $[\text{catalyst}] = 0.2 \text{ g L}^{-1}$, $[\text{H}_2\text{O}_2] = 75 \text{ mM}$, natural pH.

Table S1
BET specific surface area and pore volume of catalyst

<table>
<thead>
<tr>
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<th>BET Surface Area (m$^2$ g$^{-1}$)</th>
<th>Pore Volume (cm$^3$ g$^{-1}$)</th>
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<tbody>
<tr>
<td>CN</td>
<td>36.203</td>
<td>0.109</td>
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<tr>
<td>CFN</td>
<td>357.47</td>
<td>0.201</td>
</tr>
<tr>
<td>CFN-CN1</td>
<td>249.45</td>
<td>0.212</td>
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<tr>
<td>CFN-CN2</td>
<td>194.467</td>
<td>0.191</td>
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<tr>
<td>CFN-CN3</td>
<td>139.638</td>
<td>0.155</td>
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