Dielectric barrier discharge induced degradation of diclofenac in aqueous solution

SUPPLEMENTARY MATERIAL

The degradation of diclofenac seems to obey pseudo-first-order kinetics. The reaction rate of diclofenac was fitted by the following equation:

\[ \ln \frac{C_0}{C_t} = kt \]

where \( C_0, C_t, k \) are the initial concentration of diclofenac (mg/L), the residual concentration of diclofenac (mg/L) after DBD treatment and the reaction rate constant (min\(^{-1}\)), respectively.

The factors affecting the degradation of diclofenac are shown in Figure 2S and the results of the reaction rate constants are listed in Table 2S.

![Figure 2S](image) The factors affecting the degradation efficiency of diclofenac: (a) output power intensity \((C_0 = 20 \text{ mg/L}; \ \text{pH value} = 6.15)\), (b) initial concentrations \((\text{output power} = 50 \text{ W}; \ \text{pH value} = 6.15)\), (c) \( \text{pH value} \ \text{(C}_0 = 20 \text{ mg/L}; \ \text{output power} = 50 \text{ W})\), (d) \( \text{Fe}^{2+} \) concentrations \((\text{C}_0 = 20 \text{ mg/L}; \ \text{output power} = 50 \text{ W}; \ \text{pH value} = 6.15)\).
Table 2S | The reaction rate constants under various conditions

<table>
<thead>
<tr>
<th>The factors</th>
<th>Conditions</th>
<th>Reaction rate constant $k$ (min$^{-1}$)</th>
<th>$R^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output power intensity</td>
<td>50 W</td>
<td>0.3583</td>
<td>0.9630</td>
</tr>
<tr>
<td></td>
<td>80 W</td>
<td>0.2271</td>
<td>0.9234</td>
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<td>100 W</td>
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<td>Initial concentrations</td>
<td>10 mg/L</td>
<td>1.0321</td>
<td>0.9704</td>
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<td>20 mg/L</td>
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<td>0.9668</td>
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<td>30 mg/L</td>
<td>0.2791</td>
<td>0.9627</td>
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<td>pH value</td>
<td>2.90</td>
<td>0.3058</td>
<td>0.9418</td>
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<td>6.15</td>
<td>0.3594</td>
<td>0.9529</td>
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<td></td>
<td>10.10</td>
<td>0.2923</td>
<td>0.9203</td>
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<tr>
<td>Fe$^{2+}$ concentrations</td>
<td>5 mg/L</td>
<td>0.6325</td>
<td>0.9421</td>
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<td>20 mg/L</td>
<td>0.7356</td>
<td>0.9684</td>
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<tr>
<td></td>
<td>100 mg/L</td>
<td>0.2858</td>
<td>0.9216</td>
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