Electronic Supplementary Information (ESI)

Encapsulating Nano Rods of Copper- Biphenylamines Framework on g-C3N4 Photocatalysts for Visible-Light-Driven Organic Dyes Degradation: Promoting Charge Separation Efficiency

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NMR Data of the Synthesized Cu Complexes.

Cu(BN)

Microanalytical data (%). Found: C, 36.47; H, 3.71; N, 6.96. Calc: C, 36.81; H, 3.65; N, 7.08

$^1$H-NMR: (500 MHz, DMSO): 9.41 (s, $^{+}\text{NH}_3$), 7.72 (s, 4H, ArH), 7.25 (s, 4H, ArH).

The appearance of signal at 9.49 and the disappearance of $\text{NH}_2$ at 6.5-6.00 region indicate the presence of $^{+}\text{NH}_3$

Cu(BA)

Microanalytical data (%). Found: C, 52.63; H, 4.18; N, 4.84. Calc: C, 52.73; H, 4.39; N, 5.09.

$^1$H-NMR: (500 MHz, DMSO): 8.50 (s, $^{+}\text{NH}_3$), 7.92 (d, 2H, $j$ = 7.93, ArH), 7.23-7.08 (m, 6H, ArH), 6.97 (m, 1H, ArH)

In this case signal of $^{+}\text{NH}_3$ appeared at 8.50.

Cu(PD)

Microanalytical data (%). Found: C, 22.66; H, 3.11; N, 8.71. Calc: C, 22.74; H, 3.22; N, 8.76.

$^1$H-NMR: (500 MHz, DMSO): 9.59 (s, $^{+}\text{NH}_3$), 7.42 (s, 4H, ArH).

In this case signal of $^{+}\text{NH}_3$ appeared at 9.01.

While the all others signals of aromatic protons appeared in their respected reigons.
Fig. S1: SEM image of CN-Cu(BN) (a), and Copper, Chlorine, Carbon, Oxygen and Nitrogen (b, c, d, e, f & g) distribution by SEM-EDS mapping of CN-Cu(BN).
Fig. S2. Nitrogen adsorption-desorption isotherms and the corresponding Barrett-Joyner-Halenda (BJH) pore-size distribution curve of pure g-C_3N_4 and reformed samples. The pore-size distribution was determined from the desorption branch of the isotherms.

Fig. S3. Degradation of RhB with CN-Cu(BA) under normal room light (109 Lux) and open atmosphere of the lab.
Fig. S4. TEM images of the photocatalysts after recycling four times. (a-c) CN-Cu(BA), (d-f) CN-Cu(BN) and (g-i) CN-Cu(PD).
Supplementary Table 1. Cu²⁺ ion concentrations in pure Cu complexes and modified samples obtained by ICP-MS.

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Sample Code</th>
<th>Conc. in (ppb)</th>
<th>Volume (l)</th>
<th>weight (g)</th>
<th>Wt. % of Cu²⁺</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>CN-Cu(BN)</td>
<td>21.44840536</td>
<td>0.1</td>
<td>0.0108</td>
<td>0.020</td>
</tr>
<tr>
<td>2</td>
<td>CN-Cu(PD)</td>
<td>25.67618629</td>
<td>0.1</td>
<td>0.0124</td>
<td>0.021</td>
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<tr>
<td>3</td>
<td>CN-Cu(BA)</td>
<td>24.92075327</td>
<td>0.1</td>
<td>0.013</td>
<td>0.019</td>
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<tr>
<td>4</td>
<td>Cu(BN)</td>
<td>24216.99258</td>
<td>0.1</td>
<td>0.0151</td>
<td>16.038</td>
</tr>
<tr>
<td>5</td>
<td>Cu(PD)</td>
<td>22902.61296</td>
<td>0.1</td>
<td>0.0117</td>
<td>19.575</td>
</tr>
<tr>
<td>6</td>
<td>Cu(BA)</td>
<td>11437.55443</td>
<td>0.1</td>
<td>0.0113</td>
<td>10.122</td>
</tr>
</tbody>
</table>

Fig. S5. Band energy level of (a) CN-Cu(BA), (b) CN-Cu(BN) and (c) CN-Cu(PD) and (d) g-C₃N₄.
H¹ NMR Spectra of Cu Complexes