In-situ Growth Preparation of Cu/g-C_3N_4 Ultrathin Coating over SBA-15 for Catalytic Wet Air Oxidation of Pollutants under Extremely Mild Conditions

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Table S1. Catalytic performance comparison of Cu/CN@SBA with the various catalysts reported in the literature during CWAO of phenol.

Catalyst	C_{phenol} (g/L)	$W_{catal.}$ (g/L)	T (°C)	P_{O2} (MPa)	t (h)	X_{phenol}(%)	X (%)	References
$Cu_{0.1}$-g-C_3N_4	2.1	1	120	1	1	89.6	70.4(COD)	[1]
Pt-Pb/XC-72R	1	4	100	2	1	100	91.1(TOC)	[2]
Pt/TiO_2	1	4	100	2	1	100	88.8(TOC)	[3]
N-LCO（M）	8	1	140	1	1	100	87.9(COD)	[4]
Cu-Ce/AC	1	1	160	3	1.5	100	95.9(COD)	[5]
Cu/AC	1	2	160	3	0.5	95	94.0(COD)	[6]
$LaAlO_3$	0.5	1	200	2	1	100	90.0(TOC)	[7]
Cu_3-Al-500	2.1	1	120	1	2	100	-	[8]
LMHS	1	4	140	0.4	3	97	70.5(TOC)	[9]
MWCNTs	2	0.4	160	2.5	2	73	-	[10]
TiO_2–CeO_2	2.1	4	160	2	3	100	88.0(TOC)	[11]
Pt/Ru	2.1	4	160	2	3	100	90.0(TOC)	[12]
GO	1	0.2	155	2.5	2	-	84.5(TOC)	[13]
CeO_2/γ-Al_2O_3	1	3	160	1.5	4	96	85.3(COD)	[14]
Cu_1/$CN_{3.3}$@SBA-N	2.1	10	90	0.8	4	100	89.1(COD)	This work
Cu_1/$CN_{3.3}$@SBA-N	2.1	10	100	0.8	2	100	93.9(COD)	This work
Cu_1/$CN_{3.3}$@SBA-N	2.1	10	120	0.8	1	100	94.3(COD)	This work

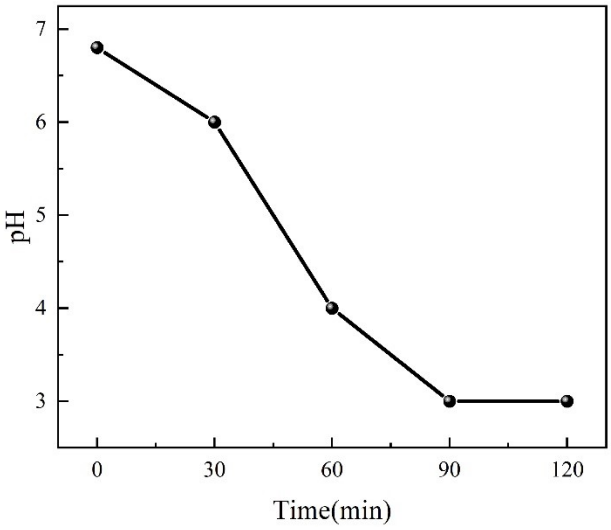

Fig. S1 The change tendency of pH value during phenol oxidation over $Cu_1/CN_{3.3}$@SBA catalyst. Reaction conditions: 50 mL phenol solution (2.1 g/L), 0.5 g catalyst, 100 ℃ and 0.8 MPa initial O_2 pressure.

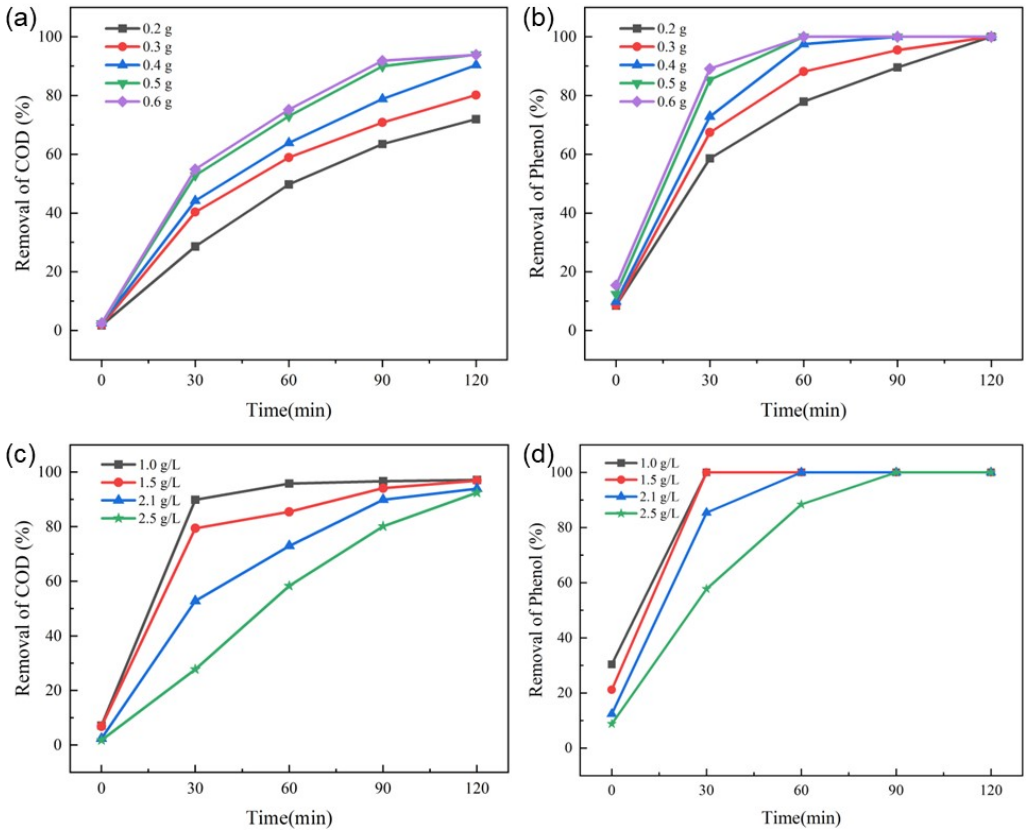

Fig. S2 Catalytic performance of $Cu_1/CN_{3.3}$@SBA catalyst under 100 ℃ and 0.8 MPa initial O_2 pressure with (a, b) different catalyst dosages and (c, d) different phenol concentration.

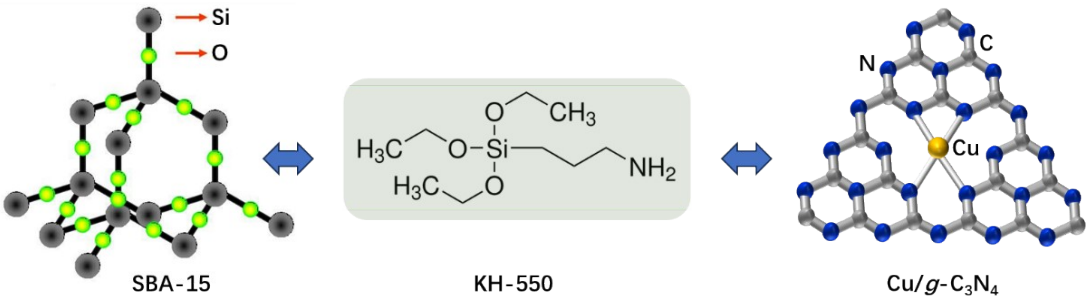

Fig. S3 Schematic diagram of KH-550 linking with SBA-15 and Cu/*g*-C_3N_4.

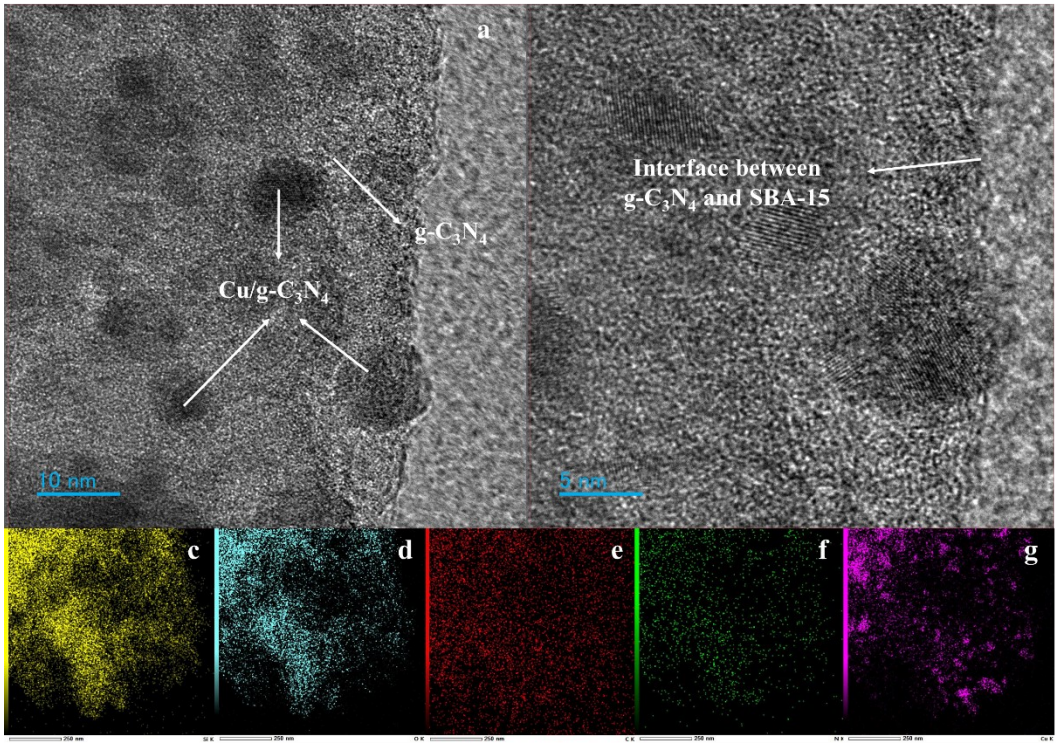

Fig. S4 HRTEM images (a, b) and EDX elemental mapping (c: Si, d: O, e: C, f: N, e: Cu) of $Cu_1/CN_{3.3}$@SBA.

The FTIR spectra of $Cu_1/CN_{1.7}$@SBA, $Cu_1/CN_{3.3}$@SBA, Cu_1/CN_5@SBA and $Cu_1/CN_{3.3}$@SBA-N are shown in **Fig. S5**. All catalysts showed characteristic peaks at 1086, 801, and 403 cm^{-1}, attributed to Si-O-Si, O-Si-O, and O-Si, respectively, almost exactly consistent with the infrared spectra of SBA-15 [15]. This phenomenon indicates that the Cu/CN thin layer is very evenly dispersed on SBA-15.

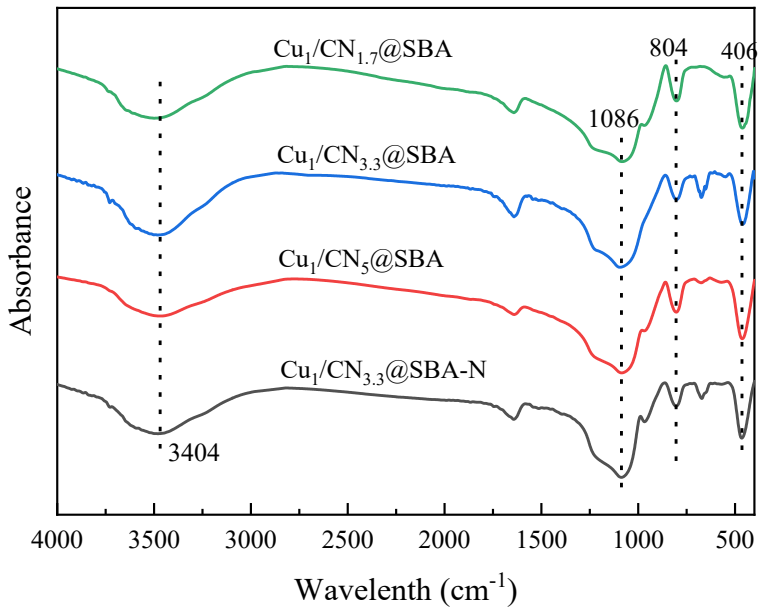

Fig. S5 FTIR spectra of $Cu_1/CN_{1.7}$@SBA, $Cu_1/CN_{3.3}$@SBA, Cu_1/CN_5@SBA and $Cu_1/CN_{3.3}$@SBA-N.

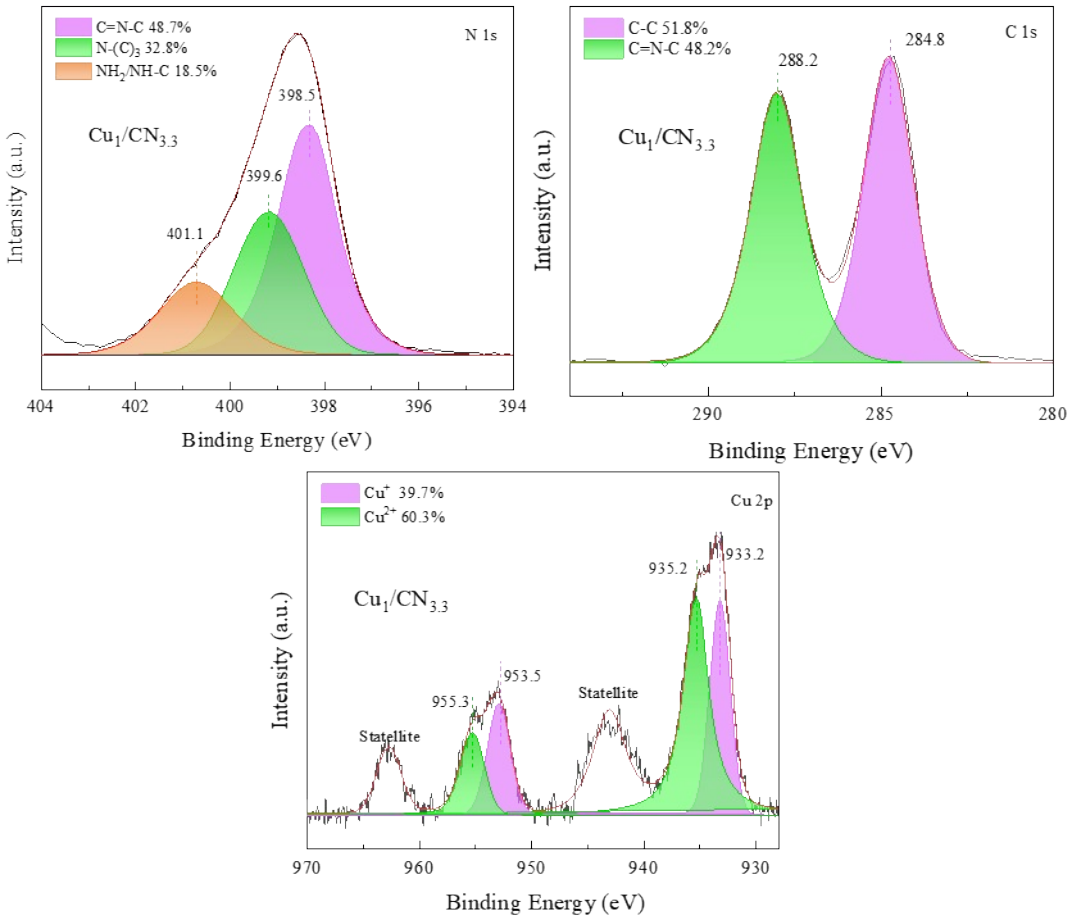

Fig. S6 XPS spectra of Cu_1/CN_3.

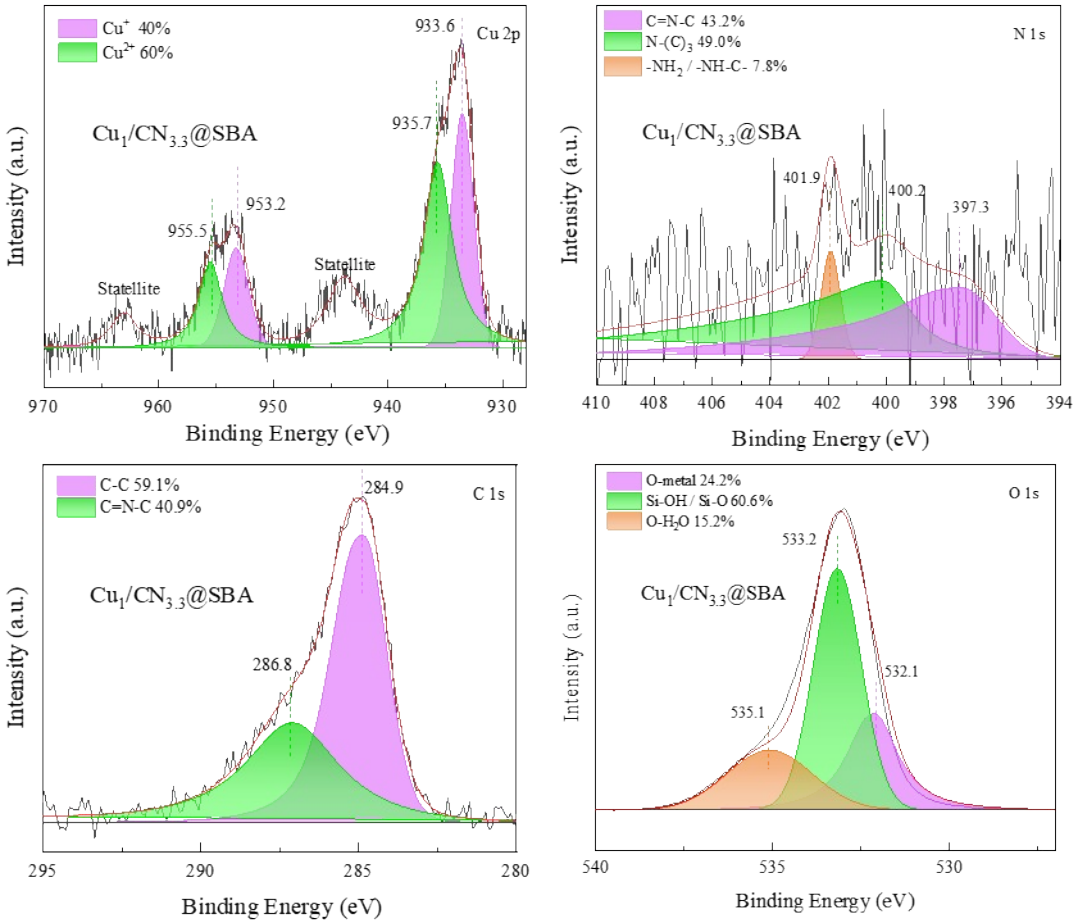

Fig. S7 XPS spectra of $Cu_1/CN_{3.3}$@SBA.

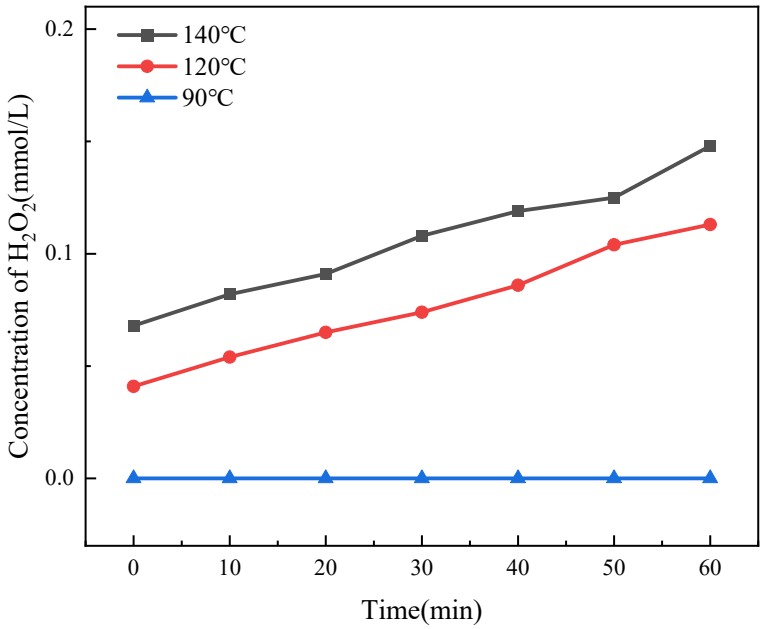

Fig. S8 Generated H_2O_2 concentration versus reaction time.

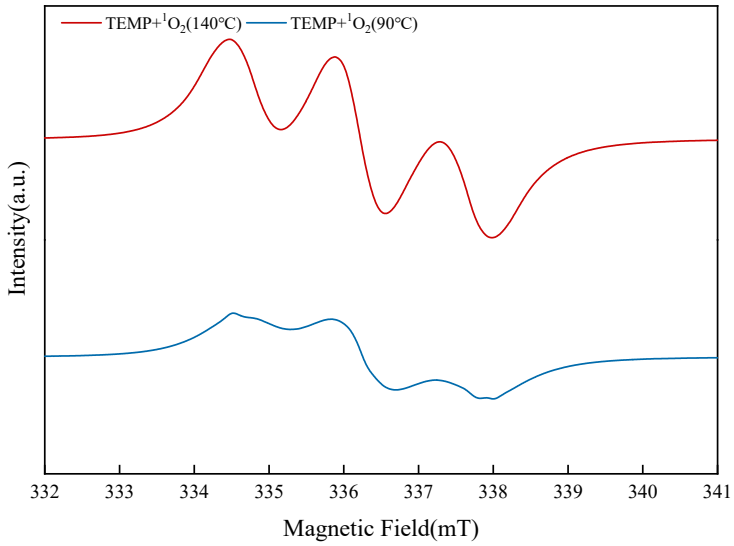

Fig. S9 EPR spectra obtained for catalytic oxidation in the presence of $Cu_1/CN_{3.3}$@SBA-N under different temperatures.

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