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The mineralization ability of chloride-resistant γ-$Cu_2(OH)_3Cl$ Fenton catalyst: effects of cation type, salt concentration and organic pollutants

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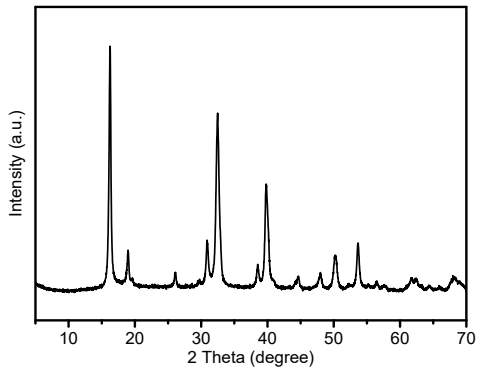

Figure S1. XRD pattern of γ-$Cu_2(OH)_3Cl$ after soaking with 15000 mg·L^{-1} NaCl solution.

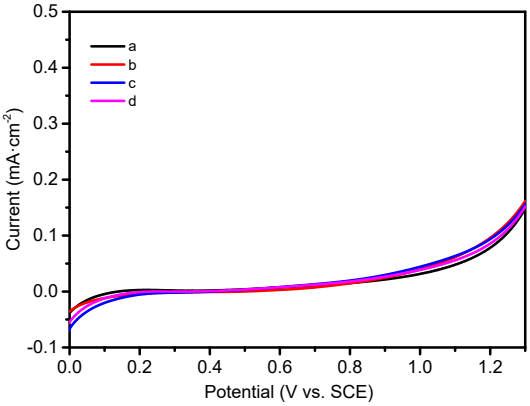

Figure S2. LSV curves in different systems, a: phenol+γ-$Cu_2(OH)_3Cl$ +NaCl, b: phenol+γ-$Cu_2(OH)_3Cl$ +KCl, c: phenol+γ-$Cu_2(OH)_3Cl$ +$MgCl_2$, d: phenol+γ-$Cu_2(OH)_3Cl$ +$CaCl_2$.

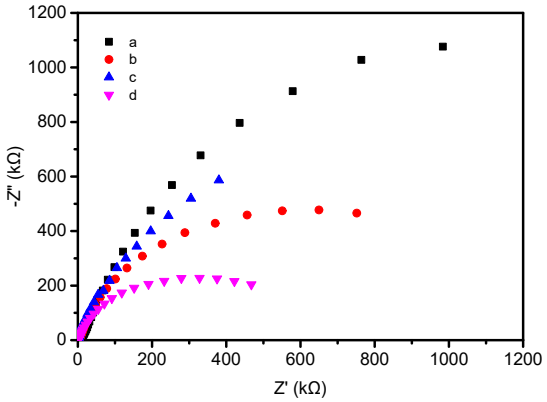

Figure S3. EIS diagrams of various systems, (a) phenol+γ-$Cu_2(OH)_3Cl$, (b) phenol+γ-$Cu_2(OH)_3Cl$+H_2O_2, (c) phenol+γ-$Cu_2(OH)_3Cl$ +NaCl, and (d) phenol+γ-$Cu_2(OH)_3Cl$ +NaCl+H_2O_2.

Table S1 Binding energies of Cu $2p_{3/2}$ and Cu^+ percentage of catalysts.

Samples	Binding energy (eV)				Percentage of Cu^+ (%)
	Cu^+	Cu^{2+}	Cu^{2+} sat.	Cu^{2+} sat.	
γ-$Cu_2(OH)_3Cl$	934.1	935.5	942.3	944.3	34.0
γ-$Cu_2(OH)_3Cl$+H_2O_2 +3000 mg·L^{-1} NaCl	934.4	935.8	942.2	944.2	39.7
γ-$Cu_2(OH)_3Cl$+H_2O_2 +15000 mg·L^{-1} NaCl	934.2	935.5	942.1	944.2	39.8
γ-$Cu_2(OH)_3Cl$+H_2O_2 +15000 mg·L^{-1} KCl	934.1	935.5	942.2	944.2	39.8
γ-$Cu_2(OH)_3Cl$+H_2O_2 +15000 mg·L^{-1} $MgCl_2$	934.0	935.5	942.3	944.3	39.9
γ-$Cu_2(OH)_3Cl$+H_2O_2 +15000 mg·L^{-1} $CaCl_2$	934.1	935.7	942.3	944.4	39.9

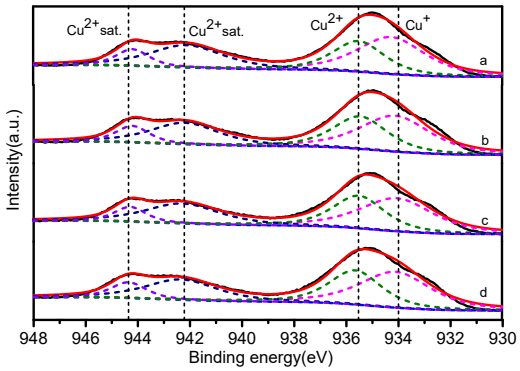

Figure S4. Cu $2p_{3/2}$ XPS spectra of (a) γ-$Cu_2(OH)_3Cl$+H_2O_2+15000 mg·L^{-1} NaCl, (b) γ-$Cu_2(OH)_3Cl$+H_2O_2+15000 mg·L^{-1} KCl, (c) γ-$Cu_2(OH)_3Cl$+H_2O_2+15000 mg·L^{-1} $MgCl_2$, (d) γ-$Cu_2(OH)_3Cl$+H_2O_2+15000 mg·L^{-1} $CaCl_2$.

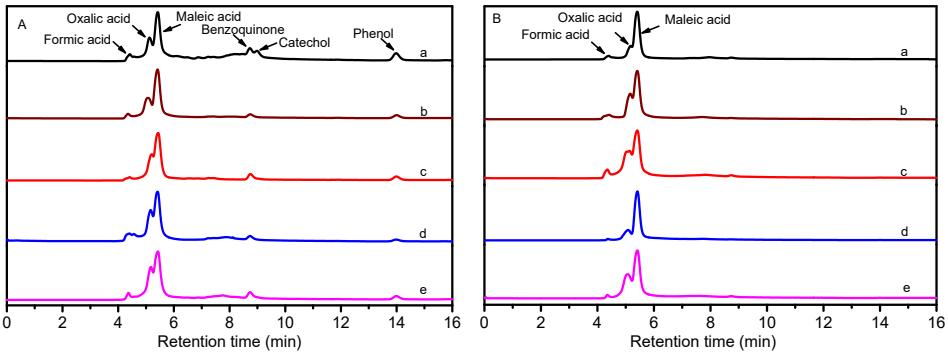

Figure S5. HPLC chromatograms of phenol mineralization at the reaction time of (A) 1 min and (B) 5 min in (a) saline-free and four saline solutions: (b) NaCl, (c) KCl, (d) $MgCl_2$ and (e) $CaCl_2$. Reaction conditions: H_2O_2 dosage 53 mmol·L^{-1}, phenol concentration 100 mg·L^{-1}, pH 6.4, 50 °C and catalyst dosage 0.4 g·L^{-1}.

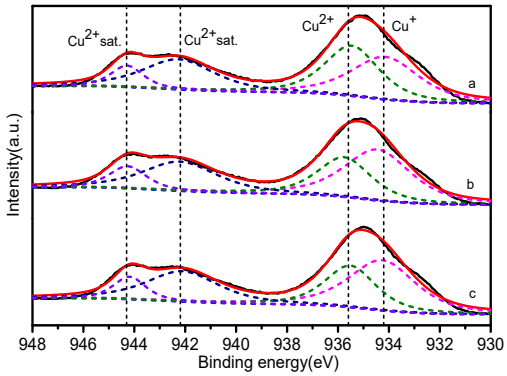

Figure S6. Cu $2p_{3/2}$ XPS spectra of (a) fresh γ-$Cu_2(OH)_3Cl$, (b) γ-$Cu_2(OH)_3Cl$+H_2O_2+3000 mg·L^{-1} NaCl, (c) γ-$Cu_2(OH)_3Cl$+H_2O_2+15000 mg·L^{-1} NaCl.