

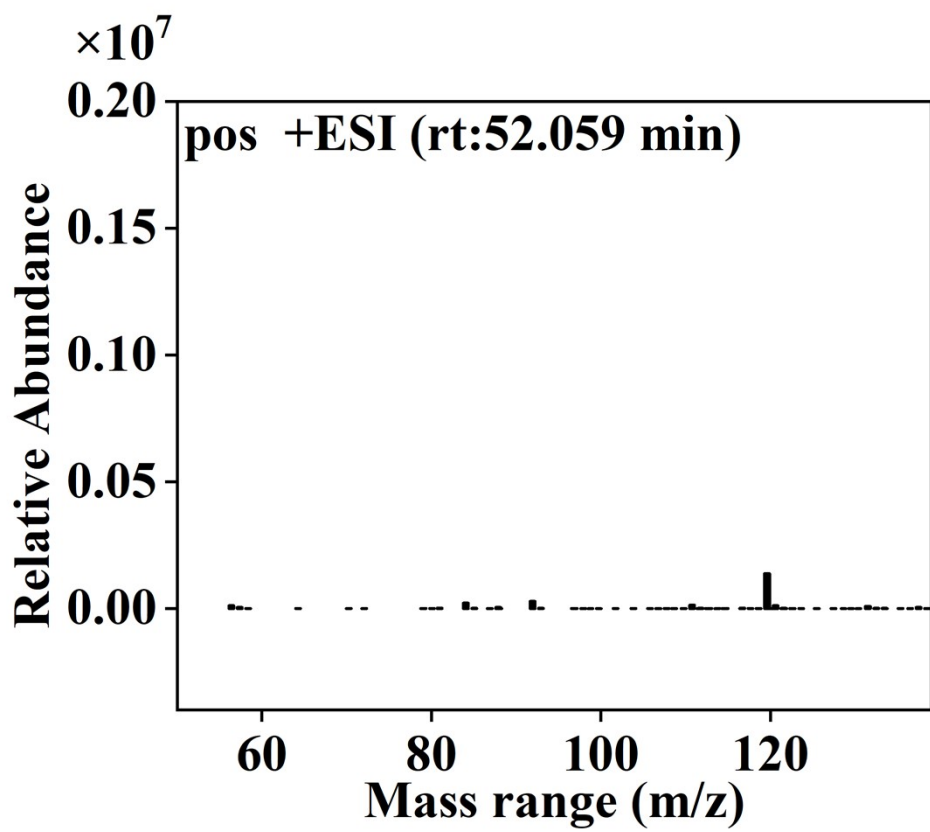
## **Exploring high catalytic performances of Cu-Co-O/N-doped carbon materials toward hydrogenation reduction and advanced oxidation reactions of 4-nitrophenol (PNP)**

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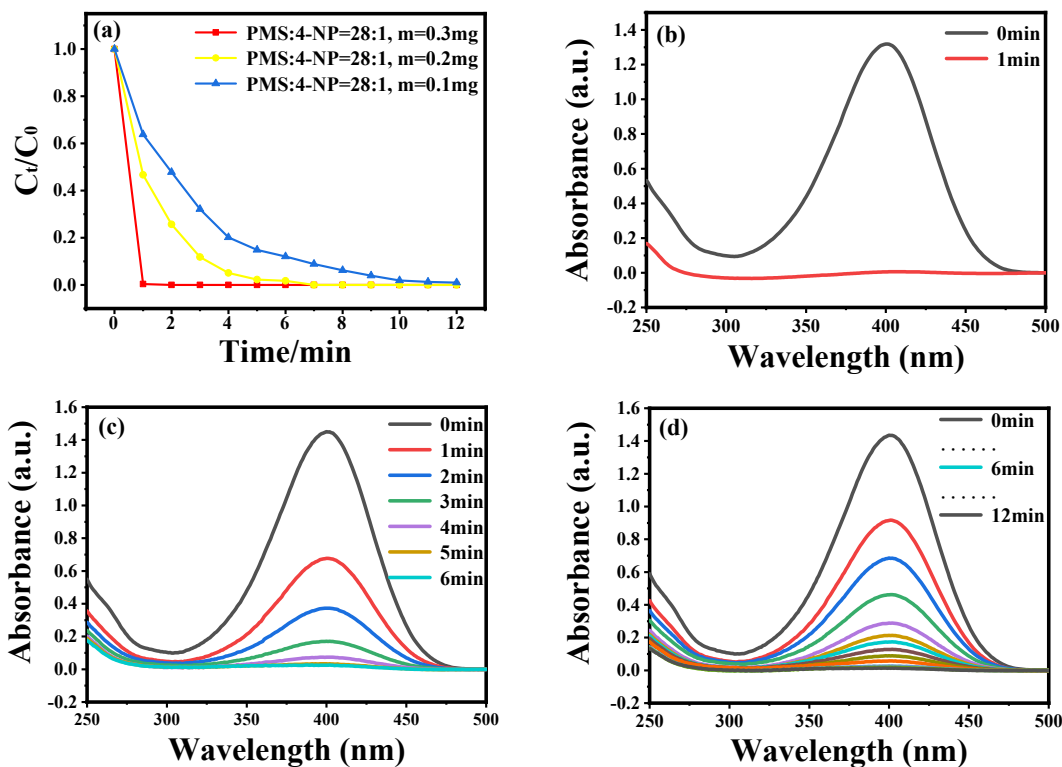
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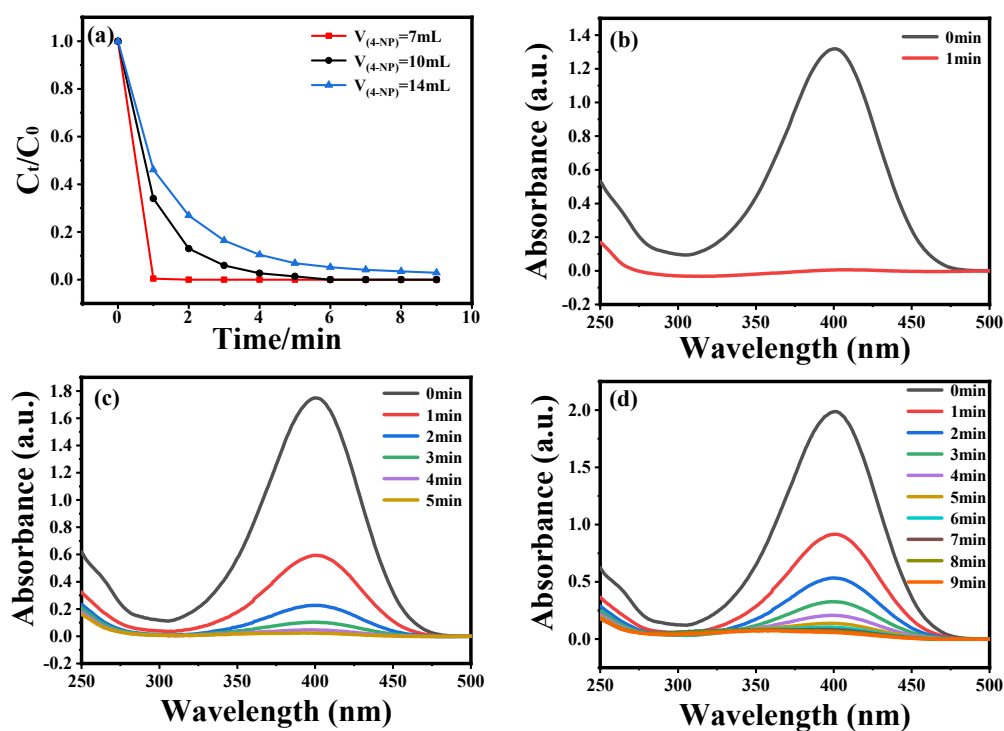
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**Figure S1.** LC-MS analysis result of the solution after oxidation reaction of PNP by PMS.



**Figure S2.** The effect of the mass of the catalyst on the advanced oxidation reaction of PNP (a-d) where the mass is 0.3 mg (b), 0.2 mg (c) and 0.1 mg (d).



**Figure S3.** The effect of the volume of the PNP solution on the advanced oxidation reaction of PNP (a-d) where the volume is 7 mL (b), 10 mL (c) and 14 mL (d).