**Supplmentary Material**

 **Catalytic Ozonation for Phenol Removal over Cobalt-doped α-MnO2 Catalyst : Performance and Mechanism**

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**Selection of catalyst doping ratio**

We prepared catalysts with different initial molar ratio of Co and Mn(0.1, 0.2, 0.3, 0.4 and 0.5 respectively). The sample with Co/Mn=0.2 had the highest catalytic ozonation of phenol (Figure S1).



Fig. S1 ozonation and catalytic ozonation by α-MnO2 and Co doped α-MnO2 with different Co/Mn molar ratios