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**Enhancement of the degradation of atrazine through CoFe₂O₄
activated peroxymonosulfate (PMS) process: kinetic, degradation
intermediates, and toxicity evaluation**

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Abstract: The degradation performance of atrazine by peroxymonosulfate (PMS) activated by CoFe₂O₄ nanoparticles (NPs) in heterogeneous catalytic process was studied in our study. In this work, first of all, influences of vital parameters (i.e., CoFe₂O₄ dose, PMS dose, initial pH, co-existing anion, and atrazine (ATZ) concentration) on ATZ removal were investigated systematically. The removal of ATZ (> 99%) and first order reaction kinetic rate constant ($K_{\text{obs}}=0.181 \text{ min}^{-1}$) were achieved after 30 min reaction with 0.4 g/L CoFe₂O₄, 0.8 mM PMS, and 10 mg/L ATZ at initial pH 6.3. In contrast, only 10% and 6% ATZ removal were achieved with PMS and CoFe₂O₄, respectively, verifying the excellent performance in the CoFe₂O₄/PMS system. In addition, reusability of the CoFe₂O₄ NPs was investigated after five successive runs. Radical quenching experiments were done and SO₄^{•-} was identified

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