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Toxicity assessment of four pharmaceuticals in aquatic environment before and after ferrate (VI) treatment

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Highlights

- Ferrate(VI) at pH 6 with 3 mg/L is effective to remove the studied pharmaceuticals.
- Toxicity was assessed using Bio-fix luminescent test and zebrafish animal model.
- Simvastatin at 10µg/L exhibited high toxicity in comparison with other pharmaceuticals.
- Ferrate(VI) treatment significantly reduced the toxicity of simvastatin
- Ferrate(VI) itself did not produce additional toxicity after dosing into the test solutions

Abstract

Micro-pollutants in aquatic environment are an emerging challenge to the human health and ecosystems. This study was to investigate the acute toxicity before and after ferrate(VI) treatment for four pharmaceuticals (simvastatin, ivermectin, fluoxetine and oxytetracycline) at concentrations of 10 and 100 µg/L, respectively. Zebrafish animal model and *Vibrio fischeri* luminescent test were employed to achieve the study targets. It is the first effort using