

The use of iron oxalate complexes and potassium persulfate for photodegradation of para-arsanilic acid

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Iron oxalate complexes and potassium persulfate are often used to increase the efficiency of photodegradation of organic pollutants, as they demonstrate good absorption of solar UV radiation and effective generation of active oxidative hydroxyl and sulfate radicals. In this work, these photoactive additives were used for the photodegradation of para-arsanilic acid (p-ASA).

p-ASA is a representative of arsenic-containing organic compounds used as feed additives. This compound is widely used in agriculture to combat intestinal parasites [1]. Although the feed additives themselves have low toxicity, the products of their biological and (photo)chemical decomposition – inorganic arsenic compounds and organic by-products - exhibit significant toxicity to living organisms. In this regard, there is interest in developing methods, including photochemical methods, for removing p-ASA and its analogues from aqueous solutions.

In the course of the work, data were obtained on the quantum yields of active radicals, the rate constants of their reactions with the target compound, and the optical properties of the secondary organic radicals formed [2]. The conditions allowing to achieve complete degradation of not only p-ASA, but also its main aromatic photoproducts are determined. It is shown that under these conditions mainly inorganic arsenic As(V) is formed, which can then be removed by known sorption methods. The data obtained are important for understanding the effectiveness of photodegradation of p-ASA under UV irradiation in water treatment processes using the above additives.

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[2] Yu.E Tyutereva et al., *J. Photochem. Photobiol. A: Chem.*, **2021**, *420*, p. 113507.