

**PENGARUH KONSENTRASI Fe<sup>2+</sup> DAN H<sub>2</sub>O<sub>2</sub> PADA OKSIDASI As(III)  
DALAM AIR MELALUI PROSES FOTO-FENTON**

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**INTISARI**

Pada penelitian ini dipelajari pengaruh konsentrasi Fe<sup>2+</sup> dan H<sub>2</sub>O<sub>2</sub> pada oksidasi ion As(III) dalam air proses foto-Fenton. Proses foto-Fenton dilakukan dengan mereaksikan larutan As(III) dengan larutan Fe<sup>2+</sup> dan H<sub>2</sub>O<sub>2</sub> di bawah sinar UV dengan konsentrasi Fe<sup>2+</sup> dan H<sub>2</sub>O<sub>2</sub> yang bervariasi. Selain itu, juga dipelajari pengaruh foto-Fenton bertahap terhadap efektivitas hasil oksidasi As(III) dalam air. Efektivitas foto-Fenton ditentukan berdasarkan konsentrasi As(V) yang terbentuk sebagai hasil oksidasi As(III). Konsentrasi As(V) dalam larutan ditentukan dengan metode spektrofotometri UV-Visibel menggunakan pereaksi molibdenum biru.

Hasil penelitian menunjukkan bahwa proses foto-Fenton dapat digunakan untuk oksidasi As(III) dalam air membentuk As(V) yang lebih aman secara efektif. Efektivitas oksidasi As(III) maksimum yaitu 83,3% tercapai dengan menggunakan Fe<sup>2+</sup> 10 mM dan H<sub>2</sub>O<sub>2</sub> 50 mM untuk konsentrasi As(III) 300 mg/L dalam volume 50 mL. Konsentrasi ion As(III) mengalami penurunan hingga memenuhi baku mutu yaitu 0,1 mg/L dapat tercapai melalui dua tahap foto-Fenton.

Kata kunci : As(III), Fe<sup>2+</sup>, foto-Fenton, H<sub>2</sub>O<sub>2</sub>, oksidasi.

## **THE EFFECT OF $\text{Fe}^{2+}$ AND $\text{H}_2\text{O}_2$ CONCENTRATIONS ON THE $\text{As}(\text{III})$ OXIDATION IN WATER BY PHOTO-FENTON PROCESS**

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### **ABSTRACT**

The effect of  $\text{Fe}^{2+}$  and  $\text{H}_2\text{O}_2$  concentrations in photo-Fenton process for  $\text{As}(\text{III})$  oxidation in water had been studied in this research. The photo-Fenton process was carried out by reacting  $\text{As}(\text{III})$  solutions under UV light with varied concentration of  $\text{Fe}^{2+}$  and  $\text{H}_2\text{O}_2$ . The influence of the second-stage of photo-Fenton process for  $\text{As}(\text{III})$  oxidation was evaluated. The photo-Fenton effectiveness was determined based on  $\text{As}(\text{V})$  concentration as the result of  $\text{As}(\text{III})$  oxidation. The concentration of  $\text{As}(\text{V})$  in solutions were determined by UV-Visible spectrophotometric method.

The result of the research demonstrated that photo-Fenton process was able to oxidized  $\text{As}(\text{III})$  to form the  $\text{As}(\text{V})$ , that was less toxic and easier to be handled quite effectively. For 300 mg/L of  $\text{As}(\text{III})$  in the 50 mL solutions, the optimum condition of the oxidation was obtained by using 10 mM of  $\text{Fe}^{2+}$  and 50 mM of  $\text{H}_2\text{O}_2$ .  $\text{As}(\text{III})$  concentration can be reduced by oxidation until fulfill the quality standard that was 0.1 mg/L by second-stage of photo-Fenton process.

Keywords:  $\text{As}(\text{III})$ ,  $\text{Fe}^{2+}$ ,  $\text{H}_2\text{O}_2$ , oxidation, photo-Fenton.