



Mineralization of o-tolidine by electrooxidation with BDD, Ti/Pt and MMO anodes

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ABSTRACT

The present study deals with the electrooxidative mineralization of o-tolidine from aqueous solution using various Ti/Pt, mixed metal oxide (MMO) and boron doped diamond (BDD) anodes. The experiments were carried out in two phases. In the first phase, the effect of anode type on the total organic carbon (TOC) removal efficiency was investigated at various pH levels. Furthermore, the second phase was carried out with the most effective anode, to investigate the effects of various operating parameters on the TOC removal efficiency, such as current density, stirring speed, inter electrode distance, concentrations of o-tolidine and the electrolyte. Also, specific energy consumption (SEC) based on the amount of electricity consumed for TOC removal was estimated. The results showed that BDD anode was much more efficient than Ti/Pt and MMO anodes for the mineralization of o-tolidine. The current density and stirring speed were the most effective parameters. With BDD anode, TOC removal efficiency realized as 54.6% and 79.9% for the current density of 25 mA/cm² and 125 mA/cm² respectively, at 150 min of processing time. On the other hand, TOC removal efficiency realized as 51.5% and 79.1% at stirring speeds of 0 and 1000 rpm at 150 min.

Keywords: Mineralization; Electrooxidation; o-tolidine; BDD anode; MMO anode

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