

## عنوان مقاله:

Mitoxantrone removal by electrochemical method: A comparison of homogenous and heterogenous catalytic reactions

## محل انتشار:

مجله مدیریت ومهندسی بهداشت محیط, دوره 4, شماره 4 (سال: 1396)

تعداد صفحات اصل مقاله: 9

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## خلاصه مقاله:

Background: Mitoxantrone (MXT) is a drug for cancer therapy and a hazardous pharmaceutical to the environment which must be removed from contaminated waste streams. In this work, the removal of MXT by the electro-Fenton process over heterogeneous and homogenous catalysts is reported. Methods: The effects of the operational conditions (reaction medium pH, catalyst concentration and utilized current intensity) were studied. The applied electrodes were carbon cloth (CC) without any processing (homogenous process), graphene oxide (GO) coated carbon cloth (GO/CC) (homogenous process) and Fe<sub>3</sub>O<sub>4</sub>@GO nanocomposite coated carbon cloth (Fe<sub>3</sub>O<sub>4</sub>@GO/CC) (heterogeneous process). The characteristic properties of the electrodes were determined by atomic force microscopy (AFM), field emission scanning electron microscopy (FE-SEM) and cathode polarization. MXT concentrations were determined by using ultraviolet-visible (UV-Vis) spectrophotometer. Results: In a homogenous reaction, the high concentration of Fe catalyst (> 0.2 mM) decreased the MXT degradation rate. The results showed that the Fe<sub>3</sub>O<sub>4</sub>@GO/CC electrode included the most contact surface. The optimum operational conditions were pH 3.0 and current intensity of 450 mA which resulted in the highest removal efficiency (96.9%) over Fe<sub>3</sub>O<sub>4</sub>@GO/CC electrode in the heterogeneous process compared with the other two electrodes in a homogenous process. The kinetics of the MXT degradation was obtained as a pseudo-first order reaction. Conclusion: The results confirmed the high potential of the developed method to purify contaminated wastewaters by MXT

## کلمات کلیدی:

Mitoxantrone, Electrodes, Nanocomposite, Organic chemicals, Carbon

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