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## Heterogeneous electro-Fenton using natural pyrite as solid catalyst for oxidative degradation of vanillic acid

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### Abstract:

Heterogeneous electro-Fenton process using a natural pyrite as solid catalyst was used to degrade vanillic acid (VA), one of the major phenolic components of olive mill wastewaters. This heterogeneous process has advantages over classical electro-Fenton process such as large working pH range, recovering and recycling of the catalyst and thus cost reduction. Experiments were performed in an undivided electrochemical cell equipped with a Pt anode and a carbon felt cathode. The effect of operating parameters such as pyrite dosage, applied current and initial pH on VA degradation has been investigated. The VA decay kinetics and the mineralization of the aqueous solutions were monitored by HPLC analysis and TOC measurements, respectively. Results showed that VA was completely removed by the reaction with hydroxyl radicals generated from electrochemically assisted Fenton's reaction. The decay kinetics of VA oxidation was found to follow pseudo-first order reaction and the rate

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