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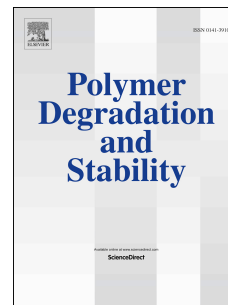
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PVC degradation by Fenton reaction and biological decomposition

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Abstract

The possibility of the degradation of the recalcitrant polymer polyvinylchloride (PVC) was the object of our study. For this purpose the Fenton reaction with subsequent biodecomposition step was successfully used. Molecular degradation fragments were determined by HPLC and GC-FID method. After the first step - degradation of PVC by the Fenton reaction, the formation of trans-1,2-dichloroethene, cis-1,2-dichloroethene, trichloroethene and tetrachloroethene was observed. Also more complex molecules such as benzene, ethylbenzene and o-xylene were identified. Probably these chemical compounds are the products of phthalates decomposition. The resulted mixture was in the second step used as a substrate for anaerobic biogas production. Biological degradation of used COD was $\alpha = 67.3\%$ and $F/I = 0.004$ [$\text{g}_{\text{COD}} \text{g}^{-1} \text{VS}$]. The decomposition of other compounds such as trans-1,2-dichlorethylene (60 %), cis -1,2-dichlorethylene (70 %) was also observed. Moreover, benzene, ethylbenzene and o-xylene were completely removed during the biological decomposition step. It is possible to assume that Fenton pretreatment improves the degradation of

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