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Treatment of laundrette wastewater using Starbon and Fenton's reagent

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ABSTRACT

The use of grey water for a variety of purposes is gaining increased popularity as a means of preserving scarce freshwater resources. In this work, catalytic oxidation over Fenton's reagent and adsorption techniques using Starbon (mesoporous material derived from polysaccharides) has been applied. These novel techniques are used as an alternative to already studied treatments of grey water such as filtration and/or biological processes. In this study, grey water, collected from a commercial laundrette, has been used. Treatment efficiency was determined by changes in the chemical oxygen demand (COD) of the grey water. Experiments using Fenton's reagent at optimum conditions of Fe^{3+} = 40 mg L^{-1}; H_2O_2 = 400 mg L^{-1} and pH 3 were very successful, resulting in a 95% COD removal after 15 min. Treatment with Starbon

adsorption was also effective, reaching up to 81% COD removal at pH 3 within 1 h. The combined treatment with Fenton's reagent and Starbon resulted in a 93% COD removal at a significantly reduced concentration of Fenton's reagent compared to the treatment with solo Fenton's reagent. This lower chemical dose has the advantage of reducing costs and lowering sludge generation.

KEYWORDS:

Chemical oxygen demand | Fenton's reagent | laundrette wastewater | Starbon

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