

SORPTION OF LEAD (Pb²⁺) FROM AQUEOUS SOLUTIONS USING CHARs OBTAINED IN THE PYROLYSIS OF FORESTRY PINE, RUBBER TIRES AND PLASTICS

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EXTENDED ABSTRACT

Introduction

Carbonaceous solid products resulting from thermochemical processes (pyrolysis, gasification), commonly known as chars, are emerging as low-cost sorbents of metallic contaminants, being their effectiveness already demonstrated in several studies (Inyang et al., 2012; Fuente-Cuesta et al., 2012; Kołodyńska et al., 2012; Quek and Balasubramanian, 2009; Devecia and Kar, 2013).

Given the fact that the commercial viability of pyrolysis and gasification plants for the treatment and valorisation of waste streams are increasingly being demonstrated, it is expected that large amounts of solid chars will be available in a near future, as by-products or as main products (pyrolysis-carbonization).

Chars may possess several characteristics which turn them effective as heavy metals sorbents: aromatic carbon matrix with relatively porous structures, the presence of functional groups or inorganic inclusions in the surface providing active sites to interact with metallic species (Inyang et al., 2012; Fuente-Cuesta et al., 2012; Kołodyńska et al., 2012; Quek and Balasubramanian, 2009; Devecia and Kar, 2013; Lu et al., 2012).

Lead (Pb²⁺) is considered as a priority substance in the field of European water policy (EU, 2000; EU, 2008) which means that measures shall be taken by the Member States to eliminate or reduce the water pollution caused by this pollutant in order to fulfill the emission/discharge limits legislated for this compound.

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