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Application of Orange Peel Waste in the Production of Solid Biofuels and Biosorbents

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Abstract

This work aimed to study the potential use of pyrolyzed orange peels as solid biofuels and biosorption of heavy metals. The dry biomass and the biofuel showed moderate levels of carbon (44-62%), high levels of oxygen (30-47%), lower levels of hydrogen (3-6%), nitrogen (1-2.6%),sulfur (0.4-0.8%) and ash with a maximum of 7.8%. The activation energy was calculated using Kissinger method, involving a 3 step process: volatilization of water, biomass degradation and volatilization of the degradation products. The calorific value obtained was 19.3 MJ/Kg. The studies of metal biosorption based on the Langmuir model obtained the best possible data fits. The results obtained in this work indicated that the potential use of waste orange peel as a biosorbent and as a solid biofuel are feasible, this product could be used in industrial processes, favoring the world economy.

Keywords: Biomass, fruit residue, pyrolysis, solid biofuel, biosorption