

The Pyrolysis of Leather and Textile Waste in Carbonised Materials as an Element of the Circular Economy Model

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Abstract : The rapidly changing fashion trends generate huge amounts of leather and textile waste globally. The complexity of these types of waste makes recycling difficult in economic terms. Pyrolysis is suggested for this purpose, which transforms heterogeneous and complex waste into added-value products e.g. active carbons and soil fertilizer. The possibility of using pyrolysis for the valorization of leather and textile waste has been analyzed in this paper. In the first stage, leather and textile waste were subjected to TG/DTG thermogravimetric and DSC calorimetric analysis. These analyses provided basic information about thermochemical transformations and degradation rates during the pyrolysis of these types of waste and enabled the selection of the pyrolysis temperature. In the next stage, the effect of gas type using pyrolysis was investigated on the physicochemical properties, composition, structure, and formation of the specific surfaces of carbonized materials produced by means of a thermal treatment without oxygen access to the reaction chamber. These studies contribute some data about the thermal management and pyrolytic processing of leather and textile waste into useful carbonized materials, according to the circular economy model.

Keywords : pyrolysis, leather and textiles waste, composition and structure of carbonized materials, valorisation of waste, circular economy model

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