ANALYSIS OF TETRA PAK PYROLYSIS RESIDUES COMPOSITION AND POSSIBILITIES OF USE

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Abstract –

Problem Statement. The constantly growing population and accelerated industrialization are resulting in the excessive production of municipal solid waste. The issue of their accumulation or disposal has become anurgent environmental and economic problem. This paper focuses on Tetra Pak (TP) multi-material cartons, which are used for liquid food storage. A major advantage of TP packaging is the high quality of the materials they are made of, but its recovery is greatly complicated by its layered construction. The pyrolysis process has been identified as a possibility for efficient processing of TP packaging.
Methods. The study characterized the solid, liquid and gaseous residues formed after pyrolysis of multi-material packaging, and analyzed the possibilities of their further management. The fractions obtained from the pyrolysis process, which was carried out under industrial conditions, were studied. Qualitative and quantitative analyses of the obtained fractions and selected instrumental analyses were performed.
Results. The solid residue was found to consist of an organic carbonaceous part and aluminum. The sorption processes and synthesis of resin- or polymer-cured monoliths were considered the most interesting direction of use of the carbon material. The liquid (oil) residue was characterized as a mixture of organic compounds. Due to its extreme flammability and carcinogenicity, it was considered hazardous. Combustion processes were identified as the best way to utilize the gas fraction.
Conclusion. There are many references in the literature to pyrolysis of TP packaging, but they focus on maneuvering process parameters to achieve the best yields. The existence of a certain gap in the literature regarding the feasibility of managing pyrolysis fractions was pointed out, and the topic was considered promising and worth exploring. The research and analysis carried out so far show that there are possibilities for effective management of the obtained fractions.

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