
PROSPECTS FOR THE PRODUCTION OF OXYGENATES BASED ON SECONDARY RAW MATERIALS IN UKRAINE

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The article considers the nomenclature of oxygenates (anti-detonation additives from recycled materials) used in motor petrol, their positive and negative properties. The article analyses the prospects for the production of oxygenates from production and consumption waste in Ukraine. It is proposed to use polymeric waste as the main raw material for the production of oxygenates: low-density polyethylene (LDPE) and high-density polyethylene (HDPE), polypropylene (PP). It has been established that due to their chemical composition, these polyolefins undergo thermal or thermocatalytic pyrolysis in a fairly wide temperature range (380-900 °C) at atmospheric or elevated pressures with the formation of liquid, gaseous and solid pyrolysis products. Structural schemes have been proposed, the implementation of which in the form of technological solutions allows obtaining oxygenates from target and by-products. Thus, aromatic hydrocarbons (in particular, $C_6H_5CH_3$) and olefins (C_2H_4 , C_3H_6 , and C_4H_8) are valuable products of thermal and thermocatalytic pyrolysis of polymeric raw materials that are promising in terms of obtaining oxygenates. By implementing the reactions of catalytic thermal oxidation of $C_6H_5CH_3$, hydration of C_2H_4 , C_3H_6 and C_4H_8 , as well as esterification of C_4H_8 (isomeric structure), resulting in the production of alpha-methylphenol (AMF), alcohols (ethanol, propanol, butanol), methyl tertiary butyl ether (MTBE) and ethyl tertiary butyl ether (ETBE). The prospects of obtaining alpha-methylphenol (AMF) by catalytic methylation of phenol removed from phenolic wastewater from coke plants are also analysed. The proposed schemes for the production of various oxygenates from secondary raw materials – waste products from LDPE, HDPE, PP and wastewater from coke plants – are more complex than those currently used in industry, but they allow the use of a new powerful source of raw materials and contribute to reducing the environmental burden.

Keywords: oxygenates, production schemes, secondary raw materials, polymers, phenolic waters, processing, pyrolysis, catalyst.

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