

CO-PYROLYSIS OF ESTONIAN SHALES WITH LOW-DENSITY POLYETHYLENE

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The effect of co-pyrolysis of low-density polyethylene with Estonian kukersite oil shale, its semicoke and Dictyonema shale on the yield and composition of the pyrolysis oil was investigated. The oil obtained in autoclaves was analyzed by thin-layer chromatography, and the composition of hydrocarbon fractions by capillary gas chromatography. The effect of co-pyrolysis was evaluated by comparison the quantity of destruction products obtained in co-pyrolysis experiments with the hypothetical mean of the destruction product quantity from single objects pyrolysis. The yield and chemical group composition of co-pyrolysis oil depends to a certain degree on the shale type used. The yields of co-pyrolysis products (gas, oil, solid residue) practically coincide with those calculated. Dictyonema shale has the strongest effect on the yield and composition of co-pyrolysis products, it increases polyethylene conversion which results in increasing the quantity of gas and decreasing that of oil because of the degradation of hydrocarbons to shorter and more volatile ones. High content of aliphatic hydrocarbons and low content of aromatic ones in the oil obtained from polyethylene changes the composition of co-processing oil resulting in low content of aromatic hydrocarbons, especially polycyclic ones.

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