

WATER CONVERSION OF OIL SHALES AND BIOMASS

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Defence of the doctoral thesis: December 2007 at Tallinn University of Technology

A method alternative to ineffective semicoking – thermal dissolution – was studied in order to separate kukersite oil shale kerogen from its mineral matter more completely. Effects of different solvents on the dissolution yield of organic matter were described. From the solvents used, supercritical water was chosen and applied for thermal dissolution of biomass as well.

A separation scheme for comparison of water conversion products of fossil and renewable fuels, basing on their subsequent dissolution in water, benzene and acetone as solvents of different polarity, was elaborated. According to this scheme applied for water conversion products of kukersite, Dictyonema argillite, pinewood and reed it was found that biomass-derived liquids differ from shale oils by significantly higher contents of water-soluble and acetone-soluble oxygen compounds, the group of the most valuable benzene fraction (the only fraction containing hydrocarbons) being similar. Replacing kukersite oil shale partly with the same amount of pinewood, the synergistic effects in total liquid yield as well as in specific solvent-soluble fractions were detected.

From these results it was concluded that both kerogeneous and lignocellulosic types of fossilized and renewable biomass can be converted into liquid fuels individually or blended in the same facilities.

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