

FLUIDIZED-BED COMBUSTION OF OIL SHALE RETORTING SOLID WASTE^{*1}

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At thermal processing of Estonian oil shale in vertical retorts to produce shale oil huge amounts of solid waste – semicoke – are formed. It has been shown that semicoke combustion seems to be a promising technology allowing utilization of the high residual-energy potential of semicoke and minimization of its negative environmental impact.

Different ways for semicoke combustion like in pulverized-firing-boilers, cement-burning kilns and a specially designed boiler-utilizer were under attention in the current research. Based on the results of calculations and analyses of the data on combustion of oil shale, semicoke and their mixtures (pulverized combustion and CFBC technology), the conclusion was drawn that only the last one will completely resolve the semicoke problem at the place of its formation. Taking into account the lack of experience in combustion of pure semicoke and semicoke with a small addition of oil shale (up to 20%), respective tests were carried out using a 50-kW_{th} CFBC device.

The main parameters of the combustion process and characteristics of ash removed from different points were determined. The experiments indicated that semicoke with a low moisture content ($W^r < 10\%$) could be burnt in fluidized bed without adding oil shale. In case moisture content is higher ($W^r > 10\%$), about 10% of oil shale must be added. Dry semicoke removal at retorting is recommended. According to calculations, thermal capacity of the boiler capable to utilize all kinds of waste fuels at the production level of the year 2001 in Viru Chemistry Group Ltd. at Kohtla-Järve should be 105–121 MW_{th}.

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