

BEHAVIOR OF SULPHUR COMPOUNDS AT COMBUSTION OF OIL SHALE SEMICOKE

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In Estonia, approximately one million tons of semicoke, a by-product of oil shale processing, is formed annually and stored in open-air dumps causing serious contamination of surroundings by environmentally harmful substances, especially sulphur compounds. Transformations of sulphur compounds in oil shale, semicoke and their mixtures at combustion, and possibilities of increasing the amount of sulphur bound in the solid phase (ash) were studied using thermogravimetric analyzer combined with TGT equipment. A series of experiments was carried out in the laboratory fluidized-bed kiln. Chemical, X-ray diffraction, IR spectroscopy methods of analysis and BET specific surface area measurements were used for characterization of the initial samples as well as of their thermooxidation products. SO₂ emission rate during thermooxidation of the samples was investigated and the amount of sulphur evolved into the gaseous phase was determined. Transformations of different sulphur forms taking place at thermooxidation (burning) were studied. It was concluded that using circulating fluidized-bed technique for utilization of semicoke, nearly complete binding of formed SO₂ by the solid phase is possible.