

LEACHING BEHAVIOR OF ASH FRACTIONS FROM OIL SHALE COMBUSTION BY FLUIDIZED BED AND PULVERIZED FIRING PROCESSES

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Impact of solid wastes from an oil shale-fired power plant (near the town of Narva, Estonia) is characterized in terms of leaching behavior. A standard test for leaching granular waste materials and sludges was used for characterization of ash fractions. Ash samples were collected from two boilers: one applying pulverized firing (PF), and the other one, installed recently, applying fluidized bed combustion (FBC) technology. Similar behavior of ash from both systems was established, however, the amount of soluble mineral matter was found to be significantly higher in FBC process. Cumulative emissions of hazardous organic pollutants, e.g. polycyclic aromatic hydrocarbons (PAH), were approximately the same for both stages of leaching. Heavy PAH, including carcinogenic benzo[a]pyrene, were detected in ash leachates of the first as well as the second stage of both technologies. However, in PF process, 7.4% of the initial amount of PAH was leached from ash samples, whereas a significantly higher amount, 15.5% was leached in the case of FBC technology. Thus, environmental hazard in deposition of solid waste from FBC process would be more significant than that from the conventional (PF) technology.

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