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EXTRACTABILITY OF HEAVY METALS IN BOTTOM ASH FROM A MEDIUM-SIZE (32 MW) MUNICIPAL DISTRICT HEATING PLANT BY ARTIFICIAL SWEAT AND GASTRIC FLUIDS

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Abstract

The bottom ash investigated in this study was sampled from a 32 MW municipal district heating plant incinerating peat (60 %) and clean bark, wood chips and sawdust (40 %) at a bubbling fluidized bed boiler. The bottom ash has high dry matter content (99.7 %), which is a disadvantage, since it can cause dust problems during handling. The highest extractable concentrations of metals in the artificial sweat were for Al (22.0 mg/kg; d.w.), As (2.7 mg/kg; d.w.) and for Ba (12.8 mg/kg; d.w), whereas in the artificial gastric fluid for Al (2210 mg/kg; d.w.), As (12.5 mg/kg; d.w.) and for Ba (91.4 mg/kg; d.w.). Therefore, we conclude that the careful handling of this residue is recommended in order to prevent the penetration of ash particles associated with heavy metals into the human gastrointestinal tract through inadvertent wiping of mouth with dirty hands or through the inhalation of ash particles.

Key words: ash, extraction, fluidized bed boiler, heavy metals, solubility

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