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BENCH SCALE TWO STAGE HEAVY METAL LEACHING TEST WITH FLY ASH FROM WOODY BIOMASS COMBUSTION

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Abstract

In this paper a two stage bench scale leaching procedure is used to assess the heavy metals release from a wood-based fly ash of a 5.0 MW_{th} grate-fired boiler. In the first step mostly K was leached with water. In the subsequent acid leaching step heavy metals were leached at a pH of 3. The remaining solids were agglomerated together with the bottom ash and the dried K-concentrate from the first leaching step whereas the filtrate was treated before discharge. In the agglomerates produced the heavy metal concentrations were below the limit concentrations for utilization. The loss of nutrients caused by the treatment was about 10% for Ca and for K 8%. The addition of 15% hydrated lime in the agglomeration step showed a very positive effect on the reduction of the fines contained in the product and on the mechanical stability of the agglomerates. The mass of the precipitate from the waste water treatment was about 10% of the mass of the fly ash. Thus, the mass of residue requiring disposal in landfill sites was reduced substantially. The heavy metal concentrations in the treated discharge water were significantly lower than typical limit values for waste water. This paper also presents the current heavy metal limit values for ash used as a soil conditioner in forestry and agriculture in Austria, Finland, Sweden, Denmark and Lithuania.

Key words: ash, biomass, heavy metals, leaching, waste

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