

Time-related diversity of municipal bottom ash chemical composition

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The chemical composition of municipal solid waste incineration bottom ash (BA) is related to a local waste stream composition. Thermal treatment causes accumulation of non-combustible fraction and final products of the process are characterised by certain level of diversity even within one installation. The BA is a heterogenous material composed of amorphous and mineral phases together with metallic fragments and other residual components.

Production of large amounts of the BA and its characteristics brings attention on its possible application potential e.g. as valuable elements resource or as raw material in concrete and ceramic industry.

The aim of this study was to investigate time-related changes over a four years period in chemical composition (determined using ICP-MS and OCP-OES methods) of BA collected from municipal waste incineration plant in Poland.

The BA is a material rich in Si (22-28 wt%), Ca (9.5-12.5 wt%), Fe (1.5-6.8 wt%), Al (3-5 wt%) and Na (3-5.2 wt%). Changes observed in minor metallic elements concentrations were relatively more significant than within the major elements. The variation range between lowest and highest content of metallic elements often exceed their average content in the BA (Figure 1).

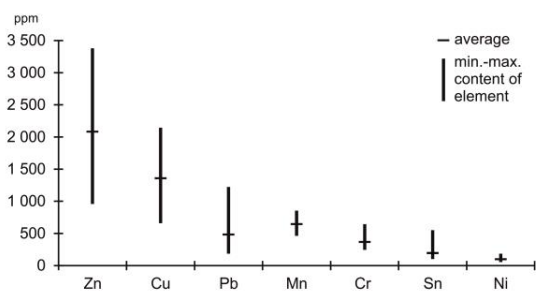


Figure 1 Content of metallic elements in the BA.

BA is characterised by high variability of chemical composition over time what makes it monitoring important in the process of BA valorisation prior to its further usage.

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