The MSW Incinerator Plant:
A Monitoring Tool for Waste Management

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ABSTRACT

Waste management lacks of quality control instruments to assess the effect of legislative, organisational and technical measures on the waste stream. In this paper results of the application of a new monitoring instrument to analyze routinely the impact of such measures on the MSW- composition are presented. Waste incineration plants transform heterogeneous wastes into much more homogeneous residues (bottom ash, filter ash, waste water, flue gas). Due to the fact, that materials tend to accumulate in certain incineration products, the chemical composition of the waste material can be determined by analysing single incineration products only. This is an easy and cost efficient method to find temporal changes in waste. The partitioning of 10 elements (C, Cl, F, S, Fe, Cu, Zn, Cd, Hg, and Pb) was examined in a modern full scale incinerator in Austria. The objective was to determine element balances by measuring inputs and outputs and analyzing the residues only. Statistical methods were used (a) to quantify uncertainties, (b) to select the appropriate incineration residues to be analyzed, (c) to determine the minimum sampling frequency of the residue, and (d) to analyze the chemical composition of municipal solid waste routinely with a given accuracy. Field measurements demonstrate, that the proposed method allows to determine annual mean waste concentrations rather accurately for a reasonable annual number of samples in the selected residues (C: $\pm$ 1%; Cl: $\pm$ 5%; S: $\pm$ 10%; heavy metals such as Cd, Zn: $\pm$ 10%, Cu and Pb: $\pm$ 20%).