



Applications



- > Waste incineration:
 - > Dioxin surrogates and VOC emissions online measurement

PROBLEMS WITH INCINERATOR EMISSIONS

Dioxin emissions from municipal and hazardous waste incinerators are a major public concern. All over the world waste is reduced to ashes and exhaust gas in incinerator plants. According to the type of waste there exist different incinerator types and categories. For example there are differences when burning municipal, industrial, clinical or hazardous waste. Emissions may vary a lot depending on the incinerated materials and the conditions in the burning process. The emission of dioxin depends on criteria which is not completely determined but related to incineration conditions such as chemical composition of waste or physical form.

Dioxin, furans and other volatile organic compounds (VOCs) emitted by incineration plants can be harmful to our health and our environment when present in the air in certain concentrations.

THE SOLUTION

The PTR-MS solutions of IONICON® give incinerator operators, control agencies and regulators the ability to quantify relevant compounds in real-time, without complicated measurement set-ups and at a detection limit as low as 5 pptv. Exhaust gas can be analyzed directly and not from samples taken before. Therefore the emission effects of specific materials can be measured during the whole burning process.

PTR-MS

- > very low detection limit (ppt-range)
- > real time measurement
- > online monitoring
- > no sample preparation



WASTE INCINERATION EMISSIONS REAL-TIME MONITORING WITH PTR-MS

PTR-MS instruments of Ionicon Analytik GmbH are powerful tools to perform online process studies in incinerators. Exhaust gas can be analyzed directly without pretreating the sample. Because of the high time resolution the emission effects of specific materials in the burning process are easy to be seen. The measurement of dioxin surrogates or indicators such as chlorophenols and naphthalene by using a PTR-MS was successfully demonstrated at incinerator plants in Japan*.

VOCs containing chlorine are potential dioxin surrogates and can be identified by their isotopic pattern.

RESULTS

The VOC species existing in the incinerator flue gases were measured at different incineration sites with four rotary kiln incinerators, two fixed bed incinerators, and one liquid-injection incinerator in service. The results shows that the occurrence of monochlorophenols and naphthalene was dramatically changed with variations of incineration conditions in short time periods.

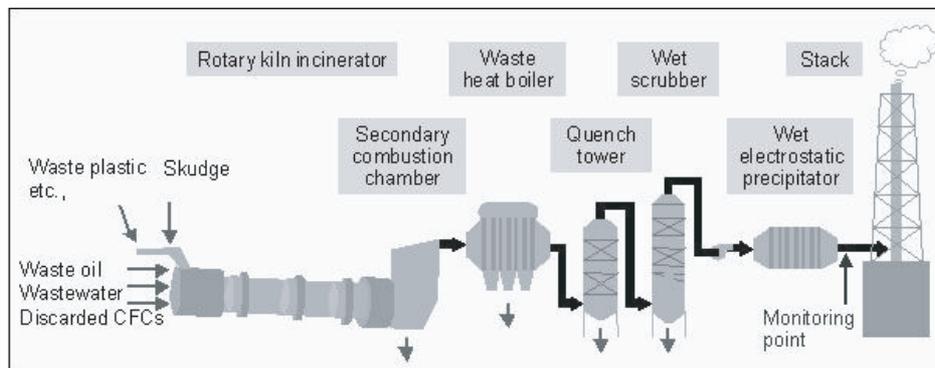


Fig. 1: Schematic drawing of experimental set up.

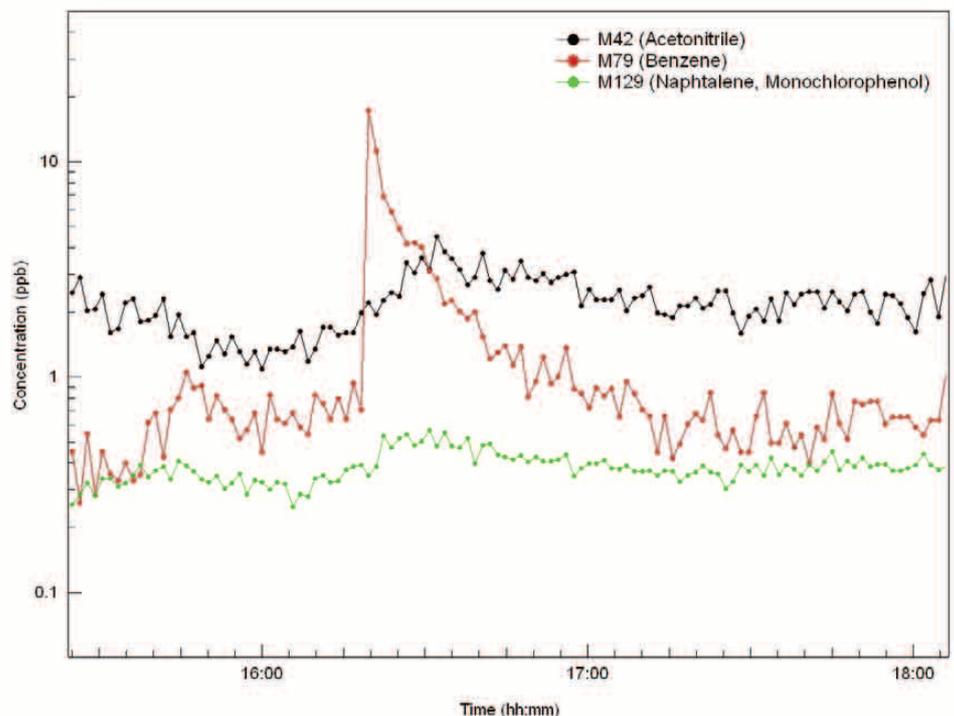


Fig. 2: Online exhaust gas measurement of a waste incineration process.

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