

## PCDD/F-CONCENTRATIONS IN CHIMNEY SOOT AND ASH FROM WOOD COMBUSTIONS IN HOUSE-HEATING SYSTEMS

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### Abstract

The combustion of wood in household heating systems produce a relatively high concentration of PCDD/F. Until now it is unknown what amount of PCDD/F in our environment is originated by household heating systems besides other sources like waste incinerators or the chloro chemistry in general. Another aspect is to see if there is a difference in PCDD/F-concentrations when waste, for example plastics are burned. For that reasons the Bayerisches Landesamt für Umweltschutz has started a project to answer these questions.

### Introduction

PCDD/F are ubiquitous in our environment. Many sources are known. The emission of PCDD/F and the content in fly ashes of waste incinerators nowadays are well known. Data on other plants or domestic heating systems are scarce (1,2). It cannot be excluded that these systems can be an additional important source.

### Experimental

Samples of chimney soot and ashes have been taken from household heating systems that are fired with wood. The heating systems were wood heatings, tile stoves and single wood ovens. The samples of soot and ashes have been taken together with the normal chimney-cleaning in November 1992, the last cleaning before was in April 1992. The heating power of the ovens were 4 - 9 kW whereas the heating had 30 kW.

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## Results and Discussion

The figures below show that the highest concentrations can be found in chimney soot from tile stoves. The PCDD/F-levels differ in total by a factor of 15-20. Single wood ovens and wood heatings have lower PCDD/F-concentrations, but the differences are up to a factor of about 70. This differences in chimney soot may be due to constructions of the ovens, different kind and size of wood, etc. Otherwise there is questionable if the differences in PCDD/F-concentrations are a result of waste incineration because many persons use their wood furnaces as private waste incinerators. Compared to chimney soot the content of PCDD/F in ashes is relatively low. Fig. 1 and 2 show the pattern of PCDD/F in chimney soot and ash of a tile stove and a central heating. Fig. 1 is a typical example for the distribution of PCDD/F in soot and ash in the same oven. Fig. 3 shows that chimney soot from wood heating ovens and fly ashes from different bavarian MWI have PCDD/F-concentrations in the same range.

## Conclusions

The measurements that are existing until now are not enough to give an ultimate estimation about the part of PCDD/F-contribution in the environment from domestic heating systems. There should be more data of PCDD/F from wood combustions in house-heating systems in soot, ashes and emissions [2]. Until now our results give no positiv evidence between high PCDD/F-levels and waste incineration. This means we need more and exact investigations also of that problems.

## References

- 1) Thoma, H., PCDD/F-Concentrations in chimney soot from househeating systems, Chemosphere, Vol. 17, No. 7, 1369-1379 (1988)
- 2) Bröker, G. et. al; Emission polychlorierter Dibenzo-p-dioxine und -furane aus Hausbrand-Feuerungen, LIS-Berichte Nr. 103 (1992)

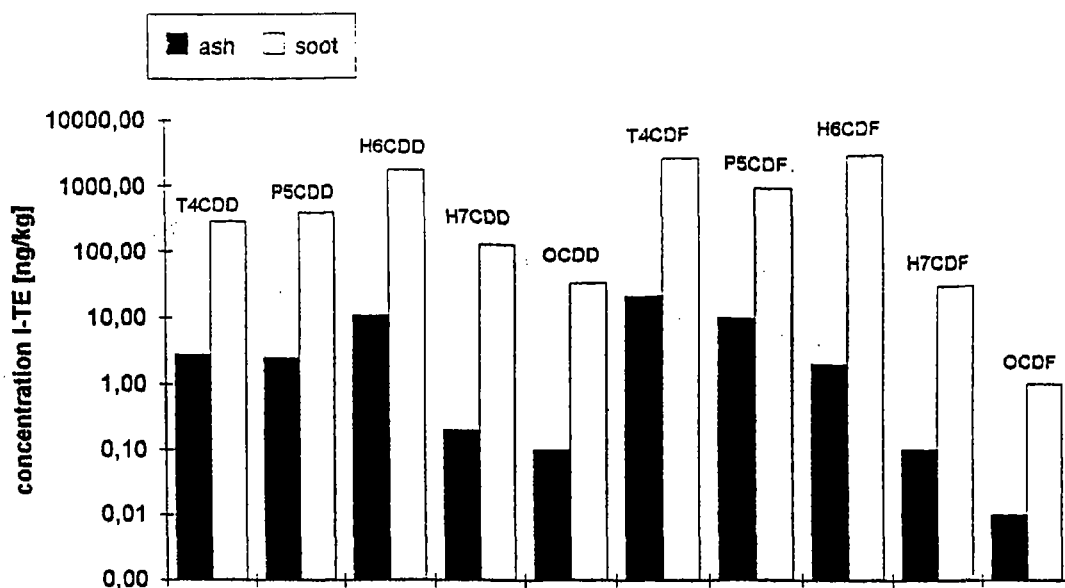


Fig.1: PCDF/D - concentrations in the soot and ash of a tile stove [9 kW]

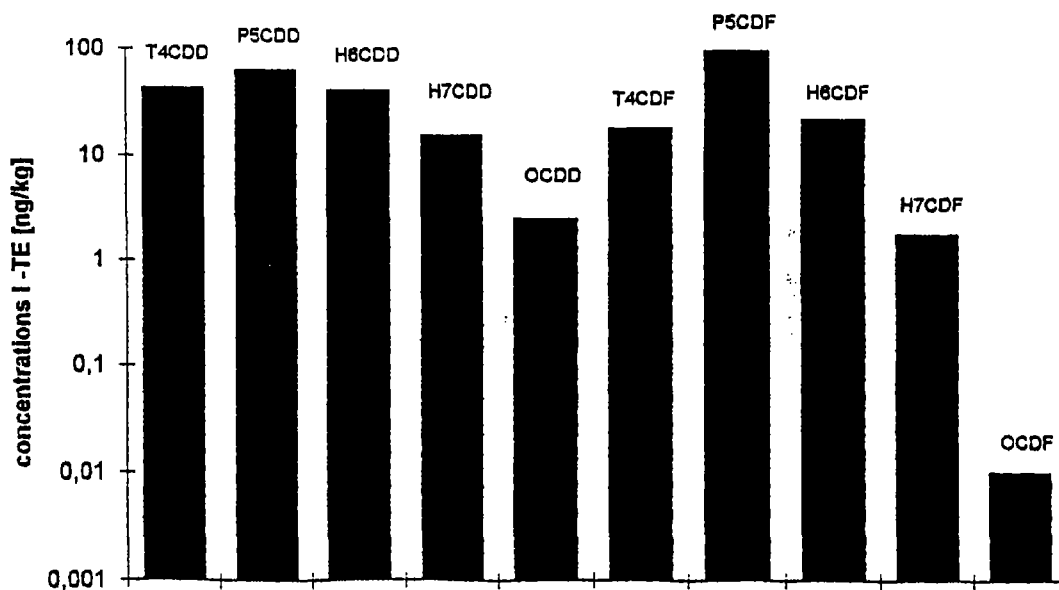
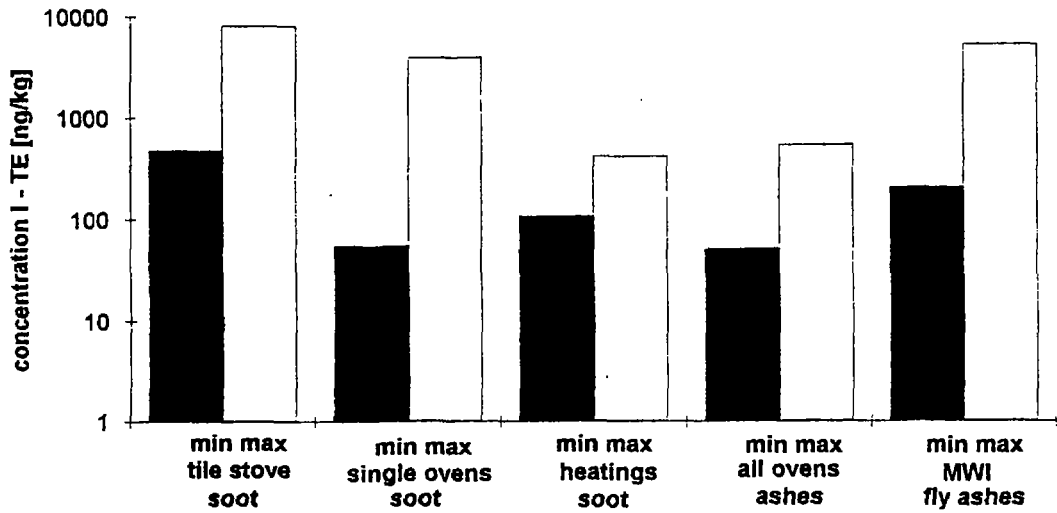


Fig.2: PCDF/D - concentrations in the soot of a heating [30 kW]

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**Fig. 3: PCDF/D - concentrations in chimney soot and ashes from wood combustion in domestic heating systems and in waste incinerators**