



**Polybrominated dibenzo-*p*-dioxins and furans:
from source of emission to human exposure**

av

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Abstract

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Brominated flame retardants (BFRs), which are ubiquitous in modern life and the environment, are the major source for polybrominated dibenzo-*p*-dioxins and furans (PBDD/Fs). The knowledge about PBDD/Fs is limited compared to other environmental pollutants, even though PBDD/Fs show similar toxicity as polychlorinated dibenzo-*p*-dioxins and furans (PCDD/Fs) which are considered to be among the most toxic man-made substances. The aim of the thesis was to provide a better understanding of PBDD/Fs by investigating the occurrence and distribution of PBDD/Fs in the following matrices: soot and gas from an accidental fire site which is a typical source of emission, blubber from marine mammals living in both far remote areas as well as areas close to anthropogenic sources, and finally in human milk from ten nursing mothers.

PBDD/Fs was detected in blubber from pilot whales sampled around Faroe Islands, which proved the occurrence in marine mammals in a far remote area. The findings of PBDD/Fs in blubber from Baltic ringed seals showed slightly higher concentrations compared to the pilot whales, which is expected since the Baltic Sea is among the world's most contaminated water areas. In the pilot whales and the ringed seals, the average contribution from PBDD/Fs to the total (PCDD/F+PBDD/F) Total Equivalent Quantity (TEQ) was low, (1-8%). In gas and soot samples from the accidental fire site, PBDD/Fs were detected in all samples and the contribution of PBDD/Fs to the total TEQ was close to 100%. In the human milk samples, PBDD/Fs were detected in all samples and the average contribution of PBDD/Fs to the total TEQ was 40%. The results indicate that PBDD/Fs are of concern for human exposure, and should be monitored together with PCDD/Fs in future studies. Moreover, the occurrence at accidental fire sites indicate that PBDD/Fs are a source for occupational exposure for firefighters and other professionals. The impact from PBDD/Fs on marine mammals seems to be of less concern.

Keywords: PBDD/Fs, PCDD/Fs, marine mammal, combustion, fire, human milk, occupational exposure

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