

Brominated Dioxins in Bay Wildlife and Sediments

RMP ECWG Meeting
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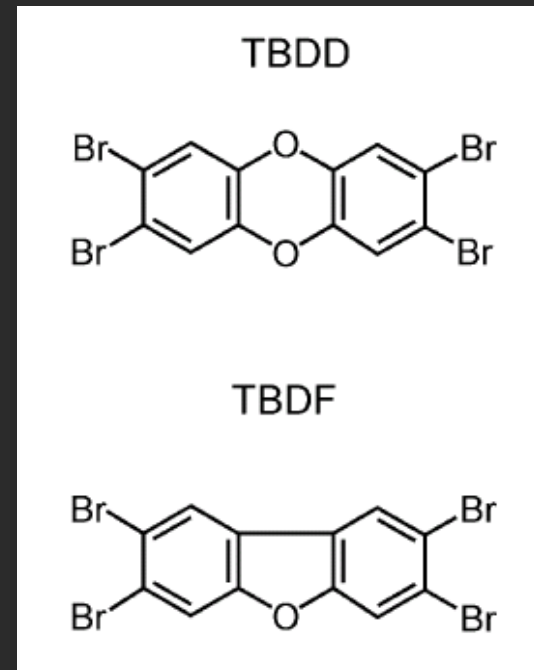
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Brominated dioxins and furans (PBDD/Fs)

Brominated analogues of chlorinated dioxins/furans (PCDD/Fs)

Sources

- impurities in BFR mixtures
- combustion of products containing BFRs and products containing Br additives (including gasoline)
- photolysis of OH-PBDEs to form tri-BDD/Fs
- Natural production



PBDD/F Occurrence Data

- Air (China, Taiwan): e-waste recycling facility (mainly tetra, penta BDFs)
- Sediment (Hong Kong and Korea)
- Shellfish (Scotland, Baltic Sea): di, tri PBDDs
- Fish (Japan)
- Cormorant eggs (Japan)
- Human milk (Belgium) and adipose tissue (Japan)
- Transferred from BFR-containing products to house dust

PBDD/F Toxicity

- Equal or greater toxicity than PCDD/Fs
- No TEFs assigned due to lack of tox and environmental data

Recent concern:

- High volume and ubiquitous use of BFRs (in-use and new products)
- BFR concentrations expected to increase
- WHO panel recommended a more thorough exposure analysis for humans is needed and that among all compounds proposed for development of TEFs, PBDD/DFs should be given high priority.

Concern for San Francisco Bay?

- Correlations with PBDEs in air, sediment, house dust
- Atmospheric transport from e-waste/recycling regions (i.e. Asia)?
- Bromine-containing consumer product manufacturing?
- Vehicle exhaust?

RMP dioxin strategy 2008-2012:
Opportunity to see if PBDD/Fs are an issue

Study Objectives

- Determine whether PBDD/Fs are present in the Bay foodweb
- Determine their TEQ concentrations relative to PCDD/DFs and dioxin-like PCBs

Samples Analyzed by AXYS Analytical

- Sediment
 - 6 samples collected in 2009 (Oakland, South Bay)
 - Also analyzed for Cl dioxins
- White croaker
 - 6 samples collected in 2009 (Oakland, South Bay)
 - Also analyzed for Cl dioxins
- Harbor seal blubber
 - 6 samples collected in 2009/2010 (SF Bay)

Samples will be sent to AXYS in April for pro bono analysis

AXYS Analytical Typical Detection Limits	
Matrix	Solids/Tissues
Units	pg/g (ppt)
Sample Size	10 grams
2,3,7, 8-TBDD	0.5
1,2,3,7,8-PeBDD	0.5
1,2,3,4,7,8/1,2,3,6,7,8-HxBDD	0.5
1,2,3,7,8,9-HxBDD	0.5
OBDD	2
2,3,7,8-TBDF	0.5
1,2,3,7,8-PeBDF	0.5
2,3,4,7,8-PeBDF	0.5
1,2,3,4,7,8-HxBDF	0.5
1,2,3,4,6,7,8-HpBDF	0.5
OBDF	2