Biomarker Focus PBDEs / flame retardants

Polybrominated Diphenyl Ethers (**PBDEs**) have been used as flame retardants over the past two decades and are **globally distributed** in the environment. PBDEs are **lipophilic compounds**, so they are easily removed from the aqueous environment and are predicted to accumulate in the food chain. There is strong concern about the health effects of PBDE exposure, because of their potential endocrine disrupting properties. PBDEs are structurally similar to PCBs, DDT, dibenzodioxins and dibenzofurans, and therefore, their chemical properties, persistence (POPs) and distribution in the environment follow similar patterns.

PBDE congeners can be **grouped** according to their **presence in technical mixtures**, and more relevant, as the first **QSAR** investigations show, to **their potential toxicology**. Like the PCBs they can be arranged in **coplanar**, **or almost not twisted mono-ortho-brominated** ones, which are similar in structure to coplanar PCBs, DDT, dibenzodioxins and dibenzofurans.



Fig.: Chemical structure, and numbering of PBDEs.

Fig.: Non-planar twisted and almost coplanar PBDEs, which are similar in their conformation to dibenzofurans or dibenzodioxins.

Chiron offers

Both **single neat and solution standards** of PBDEs are available to assist researchers in their analysis, e.g. the most prominent PBDEs as targeted by the EU. Solutions are 50 μ g/mL in iso-octane (209 is not soluble). **Please, inquire for special needs.**

Lake	Michigan Study' PBDEs	Order-no.	Other relevant PBDEs		Order-no.
28	2,4,4'-Tri-BDE	1961,12	25	2,3´,4-Tri-BDE	1960,12
47	2,2',4,4'-Tetra-BDE	1962,12	49	2,2´,4,5´-Tetra-BDE	1963,12
66	2,3´,4,4´-Tetra-BDE	1964,12	71	2, 3,4,6 ⁻ -Tetra-BDE	1965,12
85	2,2',3,4,4'-Penta-BDE*	1966,12	75	2,4,4´,6 -Tetra-BDE	1990,12
99	2,2',4,4',5-Penta-BDE	1967,12	77	3,3´,4,4´-Tetra-BDE	1991,12
100	2,2',4,4',6-Penta-BDE	1968,12	119	2,3',4,4',6-Penta-BDE	1969,12
138	2,2',3,4,4',5'-Hexa-BDE*	1970,12	183	2,2',3,4,4',5',6-Hepta-BDE*	1973,12
153	2,2',4,4',5,5'-Hexa-BDE	1971,12	190	2,3,3',4,4',5,6 -Hepta-BDE	1992,12
154	2,2',4,4',5,6'-Hexa-BDE	1972,12	203	2,2',3,4,4',5,5',6 -Octa-BDE	1975,12
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• mg to g neat materials for exposure and tox. studies are available

Supplementary

Inquire for 1 free 2atalogue





Fig.: GC-ECD chromatogram of a mixture of PBDEs, provided by Korytar, P., Leonards, P.E.G. and de Boer, J., RIVO, Netherlands Institute for Fisheries Research, IJmuiden, the Netherlands.

Recent literature

* under production

- de Boer, J., Wester, P.G., van der Horst, A., Leonards, P.E.G.; Polybrominated diphenyl ethers in influents, suspended particulate matter, sediments, sewage treatment plant and effluents and biota from the Netherlands; *Environmental Pollution*, 122 (2003) 63
- T.M. Kolic, K.A. MacPherson, E.J. Reiner, T. Ho; Levels of Polychlorinated Dioxins and Furans, Dioxin-like PCBs and Brominated Diphenylethers in Biosolids; *Organohalogen Compounds*, 61 (2003) 175
- Ontario Ministry of the Environment, Toronto, Canada (2002) Method BDE-E3430
- de Wit, C. A.; An Overview of Brominated Flame Retardants in the Environment; *Chemosphere*, 46 (2002) 583
- www.dioxin2003.org
- www.dioxin2004.org