

The FIRE Project: Risk assessment of brominated flame retardants as suspected endocrine disruptors for human and wildlife health

Brominated flame retardants (BFRs) save lives by reducing the flammability of a wide variety of commercial and household products. Despite their societal benefits, some brominated flame retardants are migrating from the products in which they are used and are entering the environment and people.



Objectives

■ From an environmental point of view, an increasingly important group of organohalogen compounds are the brominated flame retardants (BFRs), high production volume chemicals that include, among others, polybrominated diphenyl ethers (PBDEs), tetrabromobisphenol A (TBBPA) and hexabromocyclododecane (HBCD). These compounds are widely used as flame-retardants in polymers and textiles and are applied in construction materials, furniture and electric and electronic equipment. Many of these BFRs, like PBDEs, are persistent organic pollutants with a low biodegradation profile in the natural environment. Consequently, BFRs may accumulate in biota including man, but large differences can be observed between individual compounds.



- The toxicological profile of many BFRs is at present too incomplete and insufficient to perform an adequate human and ecological risk assessment.
- The FIRE project included seven themes to achieve its main objective: an integrated approach of directed toxicological studies and exposure assessments to characterise the possible emerging health risk for humans and wildlife of these compounds by endocrine-related mechanisms.

Key findings and conclusions

- BFRs as well as their oxidised metabolites can interfere *in vitro* with endocrine pathways;
- BFRs can be distinguished into separate groups based on their toxicological profile, which can change drastically after biotransformation.

Relevance and contribution to EU policy

There are indications that the recent voluntary and regulatory discontinuation of the use of the technical

penta- and octa-BDE mixtures in Europe has led to a stabilisation of human exposure to these pollutants. The results of this project will provide research support to several EU policies, including the new REACH legislation on chemicals, as well as the goals of the EU Environment and Health Action Plan, EU Sustainable Development Policy, and Community Strategy for Endocrine Disruptors. FIRE was part of the CREDO cluster of projects (www.credocluster.info)



Risk assessment of brominated flame retardants as suspected endocrine disruptors for human and wildlife health

Project acronym

FIRE

Contract number

QLK4-CT-2001-00596

FP5 Thematic Programme

Quality of Life and Management of Living Resources

Duration

42 months (2002-2006)

EC contribution

€ 4 900 000

Website

<http://www.rivm.nl/fire>

Project coordinator

Dr. Antoon Opperhuizen
National Institute for Public Health and the Environment (RIVM)
P.O. Box 1
Antonie van Leeuwenhoeklaan 9
3720 BA Bilthoven
The Netherlands
a.opperhuizen@rivm.nl