

**Science Publications Newsletter n°2**  
*Recent scientific news on brominated flame retardants*  
*October 2006*

This Newsletter is designed to inform about the numerous scientific studies conducted around the world on brominated flame retardants. The main commercial brominated flame retardants are amongst the most tested chemicals available today.

**Recent scientific studies on brominated flame retardants**

**1. US study finds Deca-BDE acceptable for use as flame retardant in mattresses — January 2006**

To address the hazards associated with the flammability of mattresses, the US Consumer Product Safety Commission has developed a performance standard to reduce mattress fires without creating additional hazards to consumers. Based on the findings of a qualitative risk assessment previously conducted (Thomas and Brundage, 2004), CPSC conducted a quantitative risk assessment to provide a more accurate estimate of the potential risk to consumers associated with exposure to FR-treated barriers used by manufacturers to meet US CPSC's open flame mattress flammability standard.

CPSC results indicate that there are a number of FR treatments available, including Deca-BDE, that can be used to meet the mattress flammability standard and that "are not expected to pose any appreciable risk of health effects to consumers."

Quantitative Assessment of Potential Health Effects from the use of Fire Retardant (FR), US Consumer product Safety Commission, see the study:

<http://www.cpsc.gov/library/foia/foia06/brief/matttabd.pdf>

**2. EU FIRE study concludes that there is no major endocrine effect from HBCD and TBBPA in fish – February 2006**

The European Union Research Cluster on endocrine disruption, CREDO, announced the results of long-term exposure studies on two of the largest volume brominated flame retardants, concluding that there were "no major endocrine effects found in fish."

The FIRE project (Flame retardants Integrated Risk assessment for Endocrine effects), set up under CREDO, performed three studies on estuarine flounders and exposed them to TBBPA and HBCD. Despite the significantly higher

exposure levels than that found in the wild, the CREDO report concludes that the flounders' "general health and toxicity parameters (behavior, survival, growth rate, and relative liver and gonad weight) were not affected."

See the study: <http://www.credocluster.info/docs/newsletter/credonews5.pdf>

### **3. UK FSA study states that the presence of some BFRs in fish is unlikely to represent a health risk – February 2006**

Results from a recent UK Food Safety Authority study on the presence of HBCD, TBBPA and Deca-BDE in farmed and wild fish and shellfish show that "(such) fish consumption was unlikely to represent a health risk." The study, published in February 2006 also examined fish oil dietary supplements. It concluded that, as the compounds were present at extremely low levels, or in many cases were not detected at all, "there was no need for the Agency to amend its advice on fish consumption." For example, the UK government study found most detection levels for the flame retardant Deca-BDE to be below 0.1 parts per billion wet weight, levels which would imply that an average adult, were it physically possible, could literally eat tonnes of fish every day without approaching any potential level of risk. Similar considerations apply for HBCD and TBBPA.

See the study: [www.food.gov.uk/multimedia/pdfs/fsis0406.pdf](http://www.food.gov.uk/multimedia/pdfs/fsis0406.pdf)

### **4. University of Utrecht's IRAS study confirms PBDEs do not have PCBs-like effects – March 2006**

A study from the University of Utrecht's Institute of Risk Assessment Sciences (IRAS), entitled "Polybrominated Diphenyl Ethers: Aspects of the Mechanism of Action", has shown that PBDEs do not have PCB-like toxic effects.

The significant information from the research revealed that PBDEs do not activate the Ah (aryl hydrocarbon) receptor, the main mechanism that PCBs activate which sets off a series of toxic responses in the body.

Annelieke Katrien Peters, *Polybrominated Diphenyl Ethers: Aspects of the Mechanism of Action*. Thesis presented in view of the fulfilment of the requirements for the award of the degree of Doctor of the University of Utrecht on 23 March 2006, Institute for Risk Assessment Science (IRAS), Utrecht University, Faculty of Veterinary Medicine, IRAS, 2006. ISBN 90-39341834.

See chapter two of the study in *Toxicological Sciences* (2004, 82(2): p 488-496),

<http://toxsci.oxfordjournals.org/cgi/content/abstract/82/2/488?maxtoshow=&HITS=10&hits=10&RESULTFORMAT=&fulltext=peters&searchid=1&FIRSTIND EX=0&volume=82&issue=2&resourcetype=HWCIT>,

see chapter three: *Toxicological Sciences* (2006 92(1):133-142),

<http://toxsci.oxfordjournals.org/cgi/content/abstract/92/1/133>

## **5. Danish EPA survey on the migration and health evaluation of chemical substances confirms brominated flame retardants not identified in toys – March 2006**

The Danish Environment Protection Agency analysed the chemical content of foam toys intended for children aged between 0 and 3 years old. No findings of HBCD, TBBPA or Deca-BDE above the detection limit of 0.1% of content set by the EU were discovered. The study concluded that the results were definitive and hence do not require further testing.

Danish Environment Protection Agency, Survey of chemical substances in consumer products no. 70, 2006. See the study:

[http://www.mst.dk/homepage/default.asp?Sub=http://www.mst.dk/udgiv/publications/2006/87-7052-098-4/html/default\\_eng.htm](http://www.mst.dk/homepage/default.asp?Sub=http://www.mst.dk/udgiv/publications/2006/87-7052-098-4/html/default_eng.htm)

## **6. NGO sponsored study indicates low potential for debromination of Deca-BDE in the environment– May 2006**

A review on the literature published on Deca-BDE commissioned by the EPHA Environment Network (EEN) indicates that the potential for significant formation of BDE 47, BDE 99 and BDE 100 in the environment due to debromination is low as the only study showing is not environmentally relevant.

The study also insists on the need for more research to clearly assess the impact on the environment of photolytic debromination of DecaBDE in dust, soils and sediments.

Stapleton, H., Brominated Flame Retardants: Assessing DecaBDE Debromination in the Environnement. See the study:

[http://www.env-health.org/IMG/pdf/Debromination\\_paper\\_04052006\\_2\\_.pdf](http://www.env-health.org/IMG/pdf/Debromination_paper_04052006_2_.pdf)

## **7. Reduction of industrial emissions to the environment from HBCD production in Europe – May 2006**

A study by the UK's Centre for Environment, Fisheries and Aquaculture (CEFAS) reported rising levels of residues of hexabromocyclododecane (HBCD) found in porpoises stranded on UK beaches. Industry is taking measures to reduce emissions from industrial facilities, known to be the major source of HBCD findings in the environment. Both the closure of a UK HBCD production site in 2003 and the voluntary emissions reduction programme implemented in the one plant producing HBCD in Europe today has led to a 99% reduction of HBCD emissions from production in Europe. Consequently, with less than 3 kg per year, today's emissions related to production in Europe are negligible.

This continuous reduction in emissions to the environment has been fully recognized within the EU risk assessment of HBCD. Such emissions reductions form part of the brominated flame retardant industry's commitment to implement progressively a Voluntary Emissions Control Programme (VECAP) through the supply chain.

Study by Centre for Environment, Fisheries and Aquaculture (CEFAS), Law, R et al. 2006 , Env Sci& tech., VOL 40 pp 2177-2183

### **8. First Annual Progress Report for industry's Voluntary Emissions Control Action Programme (VECAP) indicates significant emission reduction – May 2006**

Initiated by the industry in 2004 following conclusion of Deca-BDE EU risk assessment, VECAP, combined with an industry commitment to carry out a 10-year programme of environmental monitoring represents the industry commitment to reduce Deca-BDE emissions to the environment.

The focus of the VECAP is currently on the flame retardant Deca-BDE, but the industry intends to build on the experience gained with this substance and expand VECAP-type programmes to other brominated flame retardants and outside Europe.

For a copy of the VECAP Annual Progress Report, click on:

[http://www.bsef.com/newsmanager/uploads/2006\\_vecap\\_annual\\_progress\\_report.pdf](http://www.bsef.com/newsmanager/uploads/2006_vecap_annual_progress_report.pdf)

### **9. Berkeley University microbial debromination study confirms existing research – June 2006**

The study Microbial Reductive Debromination of Polybrominated Ethers (PBDEs) published in Environmental Science and Technology claims that, in a laboratory setting, some bacteria in the soil can transform Deca-BDE into lower forms of polybrominated diphenyl ethers (PBDEs).

The study confirms existing research showing that Deca-BDE can degrade anaerobically, but that such degradation does not produce the most prevalent of lower BDE congeners that are being found in the environment. Moreover, the conditions used in the recent study are not environmentally relevant because solvents were specially cultivated for the tests. Therefore, it is difficult to draw meaningful conclusions regarding Deca-BDE degradation in the environment from this study.

Jianzhong He, Kristin R. Robrock, and Lisa Alvarez-Cohen, Department of Civil and Environmental Engineering, University of California at Berkeley, Microbial Reductive Debromination of Polybrominated Diphenyl Ethers (PBDEs). See the study

<http://pubs.acs.org/cgi-bin/abstract.cgi/esthag/2006/40/i14/abs/es052508d.html>

### **10. UK FSA survey indicates no implication for health from PBDE and HBCD in the diet – June 2006**

In order to calculate an estimate of allowable dietary intakes of brominated compounds by UK consumers, 19 composite food group samples have been analysed. The study found limited presence of Deca-BDE and HBCD in the samples and did not detect TBBPA. Based on the results, the estimated dietary exposure to brominated compounds does not have implications for health.

UK's Committee on Toxicity of Chemicals in Food, Consumer Products and the Environment concluded that the concentrations of PBDEs, HBCD and

TBBPA detected in this and the survey for brominated chemicals in farmed and wild fish and shellfish do not raise toxicological concerns. See the UK Food Standards Agency related webpage:

<http://www.food.gov.uk/science/surveillance/fsisbranch2006/fsis1006>

### **11. EU FIRE study confirms that TBBPA is safe for human health – June 2006**

A new study from the University of Würzburg undertaken under the EU FIRE project confirms the conclusions of the EU human health risk assessment report which identified no risk to human health from the use of TBBPA. Results of the study on the toxicokinetics of TBBPA in human and rats after oral administration suggest a very low systemic bioavailability due to efficient hepatic metabolism and biliary excretion of conjugates formed.

Study performed by Ute M.D. Schauer, Wolfgang Völkel and Wolfgang Dekant, Department of Toxicology, University of Würzburg, Germany. See study:

<http://toxsci.oxfordjournals.org/cgi/content/abstract/91/1/49>

### **12. Swedish SP Institute research shows that Deca-BDE saves life and money – June 2006**

A recent study by the Swedish National Testing and Research Institute (SP), in cooperation with the Institute for Risk Assessment Sciences at Utrecht University and sponsored by BSEF, has developed a model which provides a cost/benefit analysis to include the costs to society of low levels of fire safety. SP's study aims at quantifying the gains from Deca-BDE in TVs. Based in part on the environmental risk assessment that the EU has carried out for the most common flame retardant, DecaBDE, the study finds no environment or health risks – and hence no costs to society were identified. On the benefit side, the study demonstrates that using this flame retardant could lead to gains of between 520 and 1,100 million Euros (650 million to 1,300 million USD) per year for the entire EU area, mainly through saved lives, lowered health care costs saved and lowered costs relating to damaged property.

See the report

<http://wpy.observer.se/wpyfs/00/00/00/00/00/07/DA/2B/wkr0010.pdf>

### **13. European monitoring study indicates falling levels of Penta-BDE – July 2006**

A study by the Norwegian Institute of Public Health has shown that brominated diphenyl ethers (BDE) levels in breast milk are decreasing in Europe since the late 1990s. The BDEs identified in the samples are all related to the commercial flame retardant penta-BDE, which use is restricted.

The decrease is related to a cessation in use of technical octa- and penta-BDE ahead of a restriction on these substances which enters into effect in 2004 following the EU risk assessment conclusions on these substances.

The human exposure study analysed serum and breast milk collected from volunteers in Czech Republic, the Netherlands, and Norway in 2003-2004.

The research was conducted under the FIRE project umbrella, part of a European research project on potential endocrine disruptors.

Georg Becher and Cathrine Thomsen, Norwegian Institute of Public Health, Oslo, Norway, Brominated diphenyl ethers appear in people at increasing concentrations, See the study:

<http://www.credocluster.info/docs/newsletter/credonews6.pdf>