



June 2005

Current Australian Use and Regulatory Activities on Polybrominated Flame Retardants

Background

Polybrominated flame retardants (PBFRs) are a structurally diverse category of chemicals that share a common characteristic of containing bromine, thereby conferring resistance to fire. These chemicals have widespread use in household and industrial items. In 2000, the National Industrial Chemicals Notification and Assessment Scheme (NICNAS) assessed PBFRs as Priority Existing Chemicals (PECs) for preliminary assessment due to concerns over possible persistence, bioaccumulation and their potential to cause human health effects. The NICNAS report published in 2001, recommended that industry should carefully consider the selection of PBFRs to ensure that those known to be hazardous (eg. pentabromodiphenyl ether and octabromodiphenyl ether) are avoided and that PBFRs of unknown hazard are not introduced. The report also recommended that a full risk assessment be conducted for PBFRs of concern once testing of these chemicals is completed under the OECD program. The PEC report is available at:

<http://www.nicnas.gov.au/publications/CAR/PEC/PEC20/PEC20index.asp>.

Current Australian Use Data

In October 2004, NICNAS called for information from manufacturers and importers of one or more PBFRs, or products containing them. Others with information, such as users, past importers or manufacturers, were encouraged to provide information on the uses of and alternatives to PBFRs. This data updates information on use in the PEC report.

Information was provided on twenty-one PBFRs. No manufacture of PBFRs in Australia was reported. A total of approximately 430 tonnes of PBFRs were imported in 2003-2004. This compares with a figure of 576 tonnes imported in 1998/1999, reported in the Priority Existing Chemical assessment report on polybrominated flame retardants published by NICNAS in 2001. It represents a reduction of 146 tonnes, or 25%, over that period.

Existing Chemicals Information Sheet

Quantities

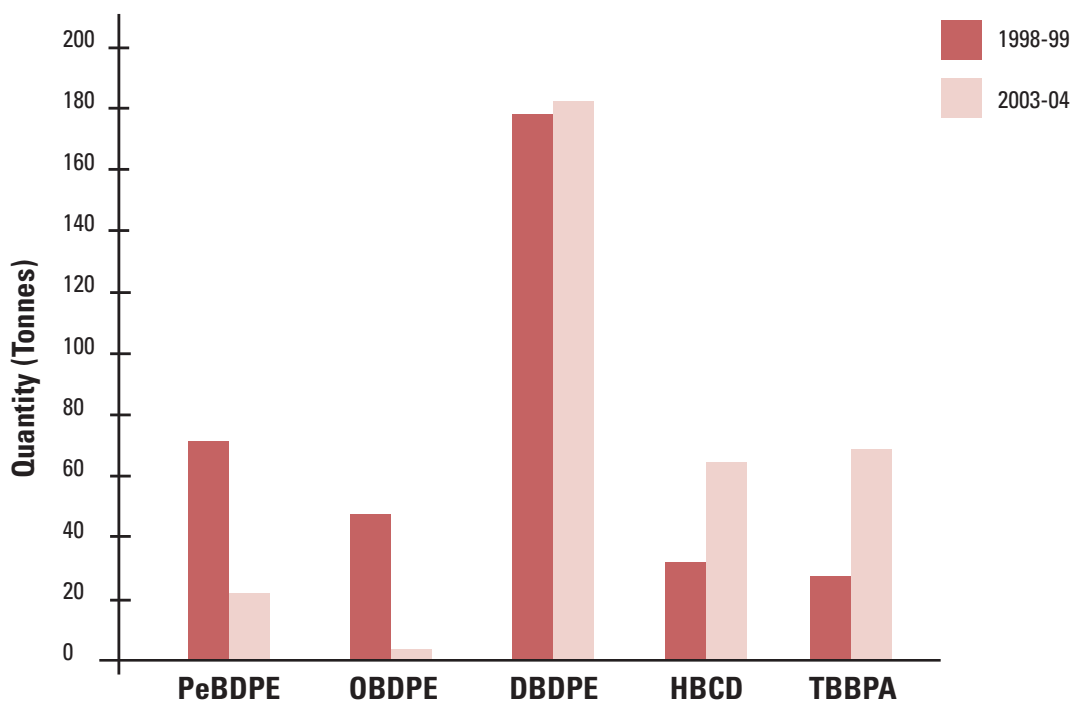
Table 1 below lists the commonly used PBFRs, and the quantities imported.

Table 1: Import of Polybrominated Flame Retardants

Chemical	CAS Number	QUANTITY IN TONNES	
		2003/04	1998/99
Decabromodiphenyl ether	1163-19-5	180	177
Tetrabromobisphenol A	79-94-7	69	32
Hexabromocyclododecane	25637-99-4	64	36
QUANTITY BETWEEN 10 AND 30 TONNES IMPORTED IN 12 MONTHS TO OCTOBER 2004			
Benzene, ethenyl-, homopolymer, brominated	88497-56-7	10-30 TONNES	26
Pentabromodiphenyl ether	32534-81-9		72
Tetrabromobisphenol A bis (2,3-dibromopropyl) ether	21850-44-2		29
Tetrabromodiphenyl ether	40088-47-9		22

Ten other commercially available PBFR chemicals including octabromodiphenyl ether were imported in quantities less than ten tonnes during the 12 months prior to October 2004.

Graph 1: Showing the Change in the Use of Some PBFRs



Existing Chemicals Information Sheet

A comparison with the data from 1998/1999 shows a marked decrease in the import of pentabromodiphenyl ether (PeBDPE) and octabromodiphenyl ether (OBDPE). A decrease in the use of approximately 90% of OBDPE and approximately 70% of PeBDPE was seen in 2003/2004 compared to 1998/1999 (refer Graph 1). There has been a small increase (~1%) in the use of decabromodiphenyl ether (DBDPE). Decabromodiphenyl ether remains the PBFR imported in the greatest quantity. In relation to PBFRs other than polybrominated diphenyl ethers, there has been a 78% increase in the import of hexabromocyclododecane (HBCD) and a 116% increase in the import of tetrabromobisphenol A (TBBPA).

Australian industry has indicated that importation/sales of PeBDPE and OBDPE ether have either already ceased, or will cease towards the end of 2005.

Detailed information concerning the 2003-04 findings is available in the May 2005 edition of *Chemical Gazette*: www.nicnas.gov.au/publications/gazette/chemgazettemay2005.asp

The responses to the NICNAS call for information into the use of PBFRs indicate that Australian industry has acted on the NICNAS recommendation to move away from the use of PeBDPE and OBDPE to flame retardants known to be less hazardous.

Uses:

PBFR chemicals are reported to be used in Australia as flame retardants in:

- the manufacture of polymers used in engineering applications requiring high flame retardancy such as: switch gears and armature; wire insulation including high voltage electrical cabling; housing for electrical equipment; electrical strip connectors; single/double connectors to join electrical wiring; other electrical and engineering appliances.
- the manufacture of polyurethane and polystyrene foams, used variously in: moulded furniture; bedding; white goods; motor vehicles; packaging; baby car seats; insulation.
- the manufacture of coatings and adhesives, including hot melt adhesives for carpet backing; epoxy resin formulations for the aerospace market.
- the manufacture of textile and paper products, including canvas products, curtains, awnings, and fabrics for motor vehicles, aircraft, and public transport.
- the manufacture of computer printers in Australia.

PBFRs in Articles

Several companies reported the import of PBFRs in finished articles. These included: TVs, high definition set top boxes, cookware, white goods (including refrigerators, freezers, washing and drying machines, dishwashers, and air conditioning units), DVDs, video projectors, and polyethylene foam acoustic panels. Quantities of PBFRs imported in such articles are also included in Table 1. Not all companies importing articles containing PBFRs may have responded and the total quantity of PBFRs entering Australia in articles is not known. The importer of high definition set top boxes indicated that the use of PBFRs in these products is being phased out.

Alternatives

A number of alternatives are being substituted, or may be substituted, for flame retardancy formerly supplied from the use of pentabromodiphenyl ether or octabromodiphenyl ether.

These include:

- a newer and less hazardous brominated flame retardant (i.e. Firemaster BZ-54)
- chlorinated flame retardants (in polyurethane foam manufacture)
- alumina dihydrate (used in latex formulations by one carpet manufacturer)
- the products of non-brominated technologies for non-flammability, and
- decabromodiphenyl ether, in some cases.

Current National Activities on PBFRs

- NICNAS declared the three commonly used PBFRs (DBDPE, HBCD and TBBPA) as PECs, effective 7 June 2005, to ascertain their risks to human health and the environment. The assessment on DBDPE will include an assessment of its degradation products, in particular octabromodiphenyl ether and pentabromodiphenyl ether. The PEC declaration notices published in the June *Chemical Gazette* can be accessed at:
<http://www.nicnas.gov.au/publications/gazette/chemgazettejun2005.asp>
- The PEC assessment of tris(2,3-dibromopropyl) phosphate (CAS No. 126-72-7) as a full risk assessment is nearing completion.
- Octabromobiphenyl (CAS No. 27858-07-7) and decabromobiphenyl (CAS No. 13654-09-6) were declared priority existing chemicals for full risk assessment in July 2004. To date, no application for the assessment of these chemicals have been received. The declaration notice can be accessed at:
http://www.nicnas.gov.au/publications/gazette/pdf/2005jun_whole.pdf#page=10
- In 2002, the Australian Government Department of the Environment and Heritage (DEH) undertook research looking at polybrominated diphenyl ethers (PBDEs) in the breast milk of Australian women. The report of this study can be viewed at:
http://www.ephc.gov.au/ephc/ocp_pbde_human_milk_1018_180105.html
DEH has just commissioned three new studies to research levels of PBDEs, HBCD and TBBPA in the broader Australian population, indoor air and in aquatic sediments. The findings of these studies are expected in late 2005 and will contribute to the NICNAS risk assessments on these chemicals.
- In early 2005 Food Standard Australia New Zealand (FSANZ) arranged for the analysis of a number of foods sampled as part of the 22nd Australian Total Diet Survey for a range of PBDEs. While food is a possible source of exposure, these results should provide actual data on levels in foods representative of the Australian diet and assist our understanding of the role of food in exposure to PBDEs. FSANZ intends to conduct dietary modelling once all the analytical results are received and publish a report on the study later this year.
- NICNAS will liaise closely with other government agencies with an interest in PBFRs such as DEH, FSANZ and Department of Industry, Tourism and Resources (DITR).