

Environmental risk evaluation reports for aryl phosphate esters

Science Summary

A new series of reports by the Environment Agency explores the risks posed to the environment and human health by aryl phosphate esters. These chemicals are commonly used in polymers such as polyurethanes, adhesives, pigment dispersions (in paint), as additives in lubricants and photographic film and in power generation fluids.

This series evaluates a group representing the major aryl phosphate ester products in Europe:

- Triphenyl phosphate
- Trixylenyl phosphate
- Tricresyl phosphate
- Cresyl diphenyl phosphate
- Tris(isopropylphenyl) phosphate
- Isopropylphenyl diphenyl phosphate
- Tertbutylphenyl diphenyl phosphate
- 2-Ethylhexyl diphenyl phosphate
- Isodecyl diphenyl phosphate
- Tetraphenyl resorcinol diphosphate

This group was highlighted for assessment during preliminary work for an Environment Agency review of flame retardants, particularly because they are potential replacements for other flame retardants that have already been identified as a risk to health or the environment. Regulators need to understand the potential consequences of such market switches before substantial replacement takes place.

The assessments in this series were produced as part of the UK Coordinated Chemical Risk Management Programme (UKCCRMP) (see www.defra.gov.uk/environment/chemicals/ukrisk.htm). The methods used in the reports follow that given in an EU Technical Guidance Document (TGD) for the risk assessment of chemical substances.

Each assessment identifies the potential risks from the production and use of the chemical substance to surface water (fresh and marine), sediment (fresh and marine) and soil systems in the environment, as well as risks to human health and secondary poisoning from bioconcentration in the food chain. Occupational and consumer health risks are not considered. The reports reviewed all the available data and published studies on the risks posed by these substances.

Only two of the substances assessed in this series have the potential to meet the persistence, bioaccumulation and toxicity (PBT) criteria in the TGD; these are trixylenyl phosphate and tris(isopropylphenyl) phosphate. Overall, all of the aryl phosphates in this series have the potential to break down in the environment, although most substances lack sufficient data to estimate a degradation half-life in river and ocean waters and sediments. Further testing is needed to verify these suppositions, and suggestions for further work are outlined in an overview report covering the whole series.

This summary relates to information reported in detail in the following outputs:

Science Reports:

Title: Environmental risk evaluation report: 2-Ethylhexyl diphenyl phosphate (CAS no. 1241-94-7)
Report Product Code: SCHO0307BQFE-E-P

Title: An overview of the environmental risk evaluation reports for aryl phosphate esters
Report Product Code: SCHO0809BQTY-E-P

Title: Environmental risk evaluation report: Annex A: Data for other aryl phosphates
Report Product Code: SCHO0809BQUA-E-P

Title: Environmental risk evaluation report: Annex B: Read-across of environmental data between aryl phosphates
Report Product Code: SCHO0809BQUB-E-P

Title: Environmental risk evaluation report: Annex C:
Consideration of hydrolysis
Report Product Code: SCHO0809BQUC-E-P

Title: Environmental risk evaluation report: Annex D:
Consideration of sorption coefficients
Report Product Code: SCHO0809BQUD-E-P

Title: Environmental risk evaluation report: Cresyl
diphenyl phosphate (CAS no. 26444-49-5)
Report Product Code: SCHO0809BQUE-E-P

Title: Environmental risk evaluation report: Isodecyl
diphenyl phosphate (CAS no. 29761-21-5)
Report Product Code: SCHO0809BQUF-E-P

Title: Environmental risk evaluation report:
Isopropylated triphenyl phosphate (CAS nos. 28108-
99-8, 26967-76-0 & 68937-41-7).
Report Product Code: SCHO0809BQUG-E-P

Title: Environmental risk evaluation report:
Tertbutylphenyl diphenyl phosphate (CAS no. 56803-
37-3)
Report Product Code: SCHO0809BQUI-E-P

Title: Environmental risk evaluation report: Tricresyl
phosphate (CAS no. 1330-78-5)
Report Product Code: SCHO0809BQUJ-E-P

Title: Environmental risk evaluation report: Triphenyl
phosphate (CAS no. 115-86-6)
Report Product Code: SCHO0809BQUK-E-P

Title: Environmental risk evaluation report:
Tetraphenyl resorcinol diphosphate (CAS no. 57583-
54-7)
Report Product Code: SCHO0809BQUL-E-P

Title: Environmental risk evaluation report: Trixylenyl
phosphate (CAS no. 25155-23-1)
Report Product Code: SCHO0809BQUM-E-P

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