

## 2016 Children's Safe Products - Reporting Rule update Draft Chemical Evaluation

CAS 68937-41-7

Substance Name Isopropylated triphenyl phosphate (IPTPP)

### Toxicity

Isopropylated triphenyl phosphate (IPTPP) is an isomeric mixture of phosphate esters derived from isopropyl phenols. Commercial mixtures may vary in the number of isopropyl substitutions and may contain some triphenyl phosphate and isopropylated diphenyl phosphates as well [1, 2]. EPA classified IPTPP a high hazard for reproductive, developmental, and neurological toxicities [1]. Changes in organ weights, reduced fertility and pup survival was observed in an oral rat study of reproduction and development. The lowest-observed-adverse-effect-level (LOAEL) was 25 mg/kg-d for increased female adrenal weights and relative ovary weights. Relative weights of liver, epididymis and adrenal glands were also observed in male rats at higher doses. IPTPP caused neurotoxicity (ataxia and degeneration of the spinal cord and peripheral nerves) in hens at and above dose of 90 mg/kg-day in a 91-day test submitted by the industry [3]. Brain cholinesterase inhibition was observed in rodent testing of a commercial mixture which contained 80% IPTPP and 20% TPP [1].

### Exposure

IPTPP is very likely to be found in children's products. In a European assessment, IPTPP was identified as a flame retardant plasticizer used in a range of PVC products, polyurethanes, textile coatings, adhesives, paints and pigment dispersions [2]. Uses in the U.S. are largely withheld as confidential business information [4], however, IPTPP isomers are listed ingredient of Firemaster®550 which is used as an additive flame retardant in flexible polyurethane foam [5]. U.S. consumer product testing has identified the profile of flame retardants contained in Firemaster®550 in foam baby products and U.S. upholstered furniture [6, 7]. The reported U.S. national production volume of IPTPP was 14,904,236 pounds/year in 2012 [3].

U.S. biomonitoring studies indicate that exposure to adults and children is occurring [8-10]. A urinary metabolite of IPTPP was measured in 100% of 22 mothers and 92% of 26 children in a 2013-14 study of families in Princeton, New Jersey. Mean and maximum level in the children's urine were 1 ng/mL and 10.1 ng/mL, respectively [9]. This same metabolite was detected at slightly higher mean levels in 100% of mothers and babies in a 2015 California study population [10].

EPA considered IPTPP to have very high aquatic toxicity, moderate persistence in the environment and high potential for bioaccumulation [1].

### References

1. EPA, *Flame Retardants Used in Flexible Polyurethane Foam: An Alternatives Assessment Update*. 2015, U.S. Environmental Protection Agency.
2. UK, Environment Agency, *Environmental risk evaluation report: Isopropylated triphenyl phosphate (CAS nos. 28108-99-8, 26967-76-0 & 68937-41-7)*. 2009, Bristol, United Kingdom.
3. EPA, *ChemView file for CAS No. 68937-41-7*. 2016. <https://java.epa.gov/chemview>.

**2016 Children's Safe Products - Reporting Rule update**  
**Draft Chemical Evaluation**

4. EPA, *Screening-Level Hazard Characterization: Sponsored chemical Isopropylated Triphenyl Phosphate*. 2010. U.S. Environmental Protection Agency.
5. Chemtura, *Safety Data Sheet Firemaster 550*. Revision date 3/31/2015. Available from [www.chempoint.com/products/download?grade=3990&type=msds](http://www.chempoint.com/products/download?grade=3990&type=msds)
6. Stapleton, H.M., et al., *Identification of flame retardants in polyurethane foam collected from baby products*. *Environ Sci Technol*, 2011. **45**(12): p. 5323-31.
7. Stapleton, H.M., et al., *Novel and high volume use flame retardants in US couches reflective of the 2005 PentaBDE phase out*. *Environ Sci Technol*, 2012. **46**(24): p. 13432-9.
8. Hoffman, K., et al., *High Exposure to Organophosphate Flame Retardants in Infants: Associations with Baby Products*. *Environ Sci Technol*, 2015. Dec 15;49(24):14554-9.
9. Butt, C.M., et al., *Metabolites of organophosphate flame retardants and 2-ethylhexyl tetrabromobenzoate in urine from paired mothers and toddlers*. *Environ Sci Technol*, 2014. **48**(17): p. 10432-8.
10. Butt, C.H., K; Chen, A; Lorenzo, A; Congleton, J; Stapleton, HM, *Regional comparison of organophosphate flame retardant (PFR) urinary metabolites and tetrabromobenzoic acid (TBBA) in mother-toddler pairs from California and New Jersey*. *Environment International*, 2016. **94**: p. 627-34.