2,4,6-Tribromophenol is rapidly absorbed from the gastro-intestinal tract and is rapidly excreted via urine and feces.

The acute oral LD$_{50}$ in rats is 1,486 mg/kg bw. The acute inhalation LC$_{50}$ in rats is greater than 50,000 mg/m$^3$. The acute dermal LD$_{50}$ in rats is greater than 2,000 mg/kg bw. This substance is considered to be non-irritating to the skin, but irritating to the eye. This substance is considered to be a sensitisier in guinea pigs.

A combined repeated dose toxicity study with the reproduction/developmental toxicity screening test [OECD TG 422] was conducted in SD rats administered by gavage at the doses of 0 (vehicle), 100, 300 and 1,000 mg/kg/day. At 1,000 mg/kg/day, body weight gain suppression, and increase of absolute and relative liver weight were observed in both sexes and increases of total protein, albumin, A/G and ALP in blood were observed in male rats. At 300 mg/kg/day, salivation was observed in both sexes and increase in blood creatinine was observed in male rats. The NOAEL for the repeat dose toxicity is considered to be 100 mg/kg/day in rats of both sexes.

Two independent in vitro gene mutation studies in bacteria [OECD TG 471] were negative. One in vitro chromosomal aberration test [OECD TG 473] was positive with and without metabolic activation. In one in vivo micronucleus assay up to MTD (maximum tolerance dose) [OECD TG 474] by intraperitoneal injection, no evidence of genotoxicity was observed.

In the above described combined repeated dose toxicity study with the reproduction/developmental toxicity screening test [OECD TG 422], SD (Crj: CD) rats received gavage doses of 0 (vehicle), 100, 300 and 1,000 mg/kg/day. No adverse effects were observed on estrous cycle, copulation index, fertility index and duration of gestation period, number of corpora lutea, and delivery findings as well as number of implants, number of total pups and live pups born, implantation index and delivery index in any of the substance-treated groups. Neonatal viability on day 4 of lactation and neonatal body weights on days 0 and 4 of lactation in the 1,000 mg/kg/day group were lower than those in the control group (about 50% for neonatal viability in the treated group). In maternal animals at the same dose, body weight was reduced by about 8 % and liver weight was increased by about 15 %. In conclusion, the oral NOAEL for reproduction/developmental toxicity is considered to be 300 mg/kg/day.

2,4,6-Tribromophenol is a white to almost white crystalline powder, which is slightly soluble in water (59 mg/L).
at 25 °C). Melting point, boiling point, vapour pressure, and partition coefficient are 93.9 °C, 244 °C, 0.042 Pa (25 °C), and log Kow = 3.89 (25 °C), respectively. This substance is abiotically not hydrolyzed regardless of the pH. Direct photolysis by UV indicated a half-life of 4.6 hours. This substance is biodegradable (BOD = 49 % after 28 days) [similar to OECD TG 301C] and the most conservative measured bioconcentration factor in fish is BCF = 513. A Mackay level III fugacity model shows that if this substance is released to water and soil, it is unlikely to be distributed into other compartments. When this substance is released to air, 29.2 % stays in air and 21.4 % is transported to water and 47.8 % is transported to soil.

This substance has been tested using aquatic species (algae, invertebrates and fish). An acute toxicity test with algae (Selenastrum capricornutum), resulted in a 72-h EC50 and a 72-h NOEC (biomass) of 0.76 and 0.22 mg/L, and a 24-72h EC50 and a 24-72h NOEC (growth rate) of 1.6 and 1.0 mg/L, respectively [OECD TG 201]. A 48-h EC50 for daphnids (Daphnia magna) was 0.26 mg/L [OECD TG 202 part 1]. A 96-h LC50 for fish (Cyprinus carpio) was 1.1 mg/L [OECD TG 203]. A chronic toxicity test was performed with daphnids (Daphnia magna) [OECD TG 211]. The 21-d NOEC for reproduction was reported to be 0.1 mg/L. A test with protozoae (Tetrahymena pyriformis) was performed and a 60h-IGC50 (50% inhibitory growth concentration) of 2.95 mg/l was reported.

**Exposure**

The production volume of 2,4,6-tribromophenol was estimated at approximately 2,500 t/year in Japan and 9,500 t/year worldwide in 2001. This substance is industrially produced in a closed system in Japan. This substance is used almost entirely as a chemical intermediate to make a flame retardant or directly as a flame retardant. The way to use this substance as a flame retardant is called "capping" i.e. the terminal -OH group of a polymer is capped with 2,4,6-tribromophenol. The reaction occurs during polymerization of oxirane to form 2,4,6-tribromophenoxy-ether. Consequently, the resulting polymer becomes flame retardant/resistant. From the use pattern of the substance, it has been suggested that it is released to the environment through various waste streams. There are some available monitoring data on environmental concentrations of this substance in Japan and over the world. The causes are ascribed to the fact that this substance is known to occur naturally through biosynthesis by benthic animals along with various bromophenols. The intake of this substance by food and water may happen because of the indirect exposure.

During production and use of this substance, occupational exposure is possible by inhalation and by the dermal routes. The workplace exposures during manufacturing processes are controlled. This chemical is normally transported from the producer to the downstream user in form of pellets in Japan. Workers normally wear protective gear such as masks, rubber gloves and goggles to prevent exposure.

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### RECOMMENDATION

The chemical is a candidate for further work.

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**RATIONALE FOR THE RECOMMENDATION AND NATURE OF FURTHER WORK RECOMMENDED**

The chemical possesses properties indicating a hazard for the human health (sensitisation, irritation and uncertainty regarding reproductive toxicity in a screening test) and the environment. It is recommended to investigate the industrial exposure in down stream application and the possible use as a germicide. If necessary a risk assessment should be performed. Countries may desire to investigate any exposure scenarios that were not presented by the Sponsor country.