THOMSON RESEARCH ASSOCIATES

Comments on the RED for Tributyltin compounds

Product Chemisry

The melting point for TBTO as listed in the Product Chemistry Chapter is in variance with that published in the literature. For example the IPCS Environmental Health Criteria for Tributyltin Compounds lists the melting point as -45 °C, not 131.93 °C.

The proper compound and CAS number are given for Tributyltin Maleate.

Dietary Exposure Assessment

The EPA is correct in concluding that the likelihood of dietary exposure is very low based on the registered end uses. The likelihood of incidental exposure from transfer from floors cleaned with sponges treated with TBT is also very low. TBT is strongly absorbed onto organic material (e.g. cellulosic sponges) and is only slightly soluble in water. A qualitative study done by Thomson showed that after 1000 rinses and squeezings cellulosic sponges treated with TBT still showed activity against bacteria and fungus.

Ecological Hazard Assessment

The model for leaching of TBT from wood was developed for a short time period (five hour rain cycle) but has been extended to 67 five hour rain cycles by multiplying the five hour result by a factor of 67. However, one would expect the amount of TBT leached from wood to decrease in an exponential pattern rather than stay constant. Has the EPA confirmed that the assumption used in the report is valid or likely to be valid?

Environmental Fate Assessment

The Assessment discusses levels of TBT in the environment and in aquatic organisms. It is generally accepted that by far the largest portion of TBT in water and sediment (especially marine environments) is from the past use of TBT in anti-fouling paint for boats and ships. This end use has been discontinued around the world for a number of years. Accordingly, published literature does show that TBT levels are declining. (See Fent, Karl; *Critical Reviews In Toxicology*, 26(1) p1-117, 1996 among others.) The amount of TBT released from treated articles will be small. TBT levels in treated articles are far lower than in anti-fouling paints. The TBT in treated articles is anchored to the article, not released to the general environment.

49 Gervais Drive, Toronto, Ontario, Canada M3C 1Y9
Tel: 416.955.1881 • Fax: 416.955.1887 • email: tra@ultra-Fresh.com
www.ultra-fresh.com

Dietary and Drinking Water Exposure Chapter

The concern about the possibility of incidental exposure to TBT from floors cleaned with sponge mop-heads, etc. that have been treated at the manufacturing stage with TBT is puzzling. The TBT is used to treat cellulosic sponges to prevent fungal growth during shipping and storage. When packaged at manufacture the sponges have a moisture content high enough to readily support fungal growth. Unless the sponge is moist it will becomes hard, shrunken and unappealing to consumers. The level of treatment is up to 0.05% TBTM based on the weight of the sponge. The organic nature of the cellulose will anchor the TBT. In-house testing has shown that the anti-fungal properties are preserved after 1000 rinses (with water, soap & water, fruit juice, etc) and squeezings. Coupled with the submitted study showing no detectable transfer of TBT from textile to skin the potential for exposure is very low.

Toxicology Chapter

The question about bridging data between the different species of TBT is raised. Data has been submitted prior to the EPA confirming the rationale. The biologically active moiety is the TBT cation. For TBT Benzoate and TBT Maleate the number of TBT units is half of that of TBT Oxide. Data in published literature confirms that once normalized for the number of TBT units the toxicity of different species is fairly uniform.

A more troubling issue is the over-reliance on the paper by Vos et al. Vos uses only a small number of animals in each test group. The standard deviations are of such magnitude that when comparing mean values between test groups there is a large degree of overlap indicative of there not being a significant difference between the different doses.

Nor does Vos offer any explanation as to why the NOAEL should be 0.025 mg/kg. The NOAEL lies between 0.025 and 0.25 mg/kg. The paper Immunotoxicity Of Bis(Tri-n-butyltin) Oxide In The Rat by F. Verdier, et al (J. Tox & Environ. Health, vol 32, p 302-317, 1992) states that at a dose of 0.5 mg/kg “represents a no observed effect level for immunotoxicity in the Sprague-Dawley rat”. Likewise P. Carthew, et al (Human & Exper Tox, vol 11, p 71 – 75, 1992) found that a dietary exposure of 150 ppm for 6 weeks in rats did not produce a significant exacerbation of the pathogenesis of virus- or mycoplasma-induced pneumonia in live rats. Neither papers are considered by Vos or in the review.

The Chapter uses a dermal absorption factor of 15%. This is at variance with the published literature. IPCS Environmental Health Criteria for Tributyltin Compounds gives a value of 10%.

49 Gervais Drive, Toronto, Ontario, Canada M3C 1Y9
Tel: 416.955.1881 • Fax: 416.955.1887 • email: tra@ultra-Fresh.com
www.ultra-fresh.com

The Chapter refers to two submitted studies that examine the transfer to skin from treated textiles. To clarify, one study, the earlier one, used wool as a surrogate for human skin. Under the extreme conditions (very high moisture, large surface area) used in the study about 7% of the TBT was transferred after four weeks. The second study used fresh pig skin as a surrogate for human skin. In this study under the same conditions no detectable level of TBT was transferred to the pig skin. The difference being that wool is better at attracting and retaining TBT than animal skin. The Chapter states that it has not had an opportunity to fully review the studies, both of which have been accepted by the Australian Pesticides & Veterinary Medicines Authority. These studies should be reviewed prior to the REDs being finalized.

49 Gervais Drive, Toronto, Ontario, Canada M3C 1Y9
Tel: 416.955.1881 • Fax: 416.955.1887 • email: tra@ultra-Fresh.com
www.ultra-fresh.com