6PPD-QUINONE
ENVIRONMENTAL REPORT

TOXICITY

6PPD and 6PPD-quinone enter the environment through tire-wear and are sufficiently water-soluble to enter river systems via urban runoff. From here they become widely distributed (at decreasing levels) from urban rivers through to estuaries, coasts and finally deep-sea areas. PD-quinone is of environmental concern because it is toxic to coho salmon, killing them before they spawn in freshwater streams It is not known why the ozone-oxidised 6PPD is toxic to coho salmon, but has been suggested that the large differences in lethal dose between species may relate to their ability to rid themselves of 6PPD-Q via glucuronidation. Stormwater exposure can cause acute mortality of coho salmon (Oncorhynchus kisutch), and 6PPD-quinone (6PPD-Q) was identified as the primary causal toxicant. 6PPD itself is deadly to rotifers, especially in combination with sodium chloride, though not at the level generally found in the runoff from road salt.[A small-scale biomonitoring study in South China has shown shown both 6PPD and 6PPDQ to be present in human urine; concentrations were low but the health implications are unknown Fish LC50 ; coho salmon 0.095 ug/l; brooh trout0.059 ug/l; rainbowtrout 1.0 ug/l

Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Do NOT allow product to come in contact with surface waters or to intertidal areas below the mean high water mark. Do not contaminate water when cleaning equipment or disposing of equipment wash-waters.

Wastes resulting from use of the product must be disposed of on site or at approved waste sites.

Phenylenediamines are not readily biodegradable via CO2 evolution, but they are susceptible to both hydrolysis and photodegradation. These materials have been shown not to partition to water or air if released into the environment due to their low water solubility and low vapor pressure. Analytical studies of hydrolysis products indicate that the molecule cleaves at the aromatic carbon-nitrogen bond.

It is difficult to define clearly the ways in which phenylenediamines are eliminated from the hydrosphere. Elimination processes such as oxidation reactions, adsorption, and stripping effects can only be conjectured. It is impossible to say with any degree of certainty for any of the three isomers what proportion of their elimination is accounted for by biodegradation. The following elimination rates have been found: between 0 and 69 % for o-phenylenediamine, between 0 and 60 % for m-phenylenediamine and between 0 and 100 % for p-phenylenediamine. It is assumed that any phenylenediamines released into the atmosphere are destroyed by photodegradation. The calculated half-life is less than 2 hours. The low POW values indicate that bioaccumulation is unlikely to occur to any significant degree. Only one study has dealt with the behaviour of phenylenediamines in soil, in respect to their soil sorption and geoaccumulation. According to this study, adsorption is relatively strong at low concentrations and expandable clay minerals

but quite weak at higher concentrations. No information is available on the sorption behaviour against organic material.

The substituted p-phenylenediamines and presumably the other isomers, in general, are very toxic to aquatic organisms.

DO NOT discharge into sewer or waterways.

MARINE POLLUTANT