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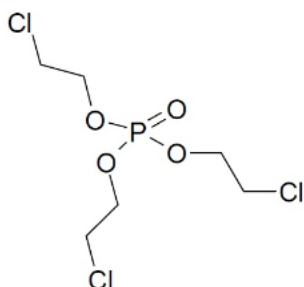
TCEP

Overview

TCEP, Tris(2-chloroethyl) phosphate, is a current use flame-retardant commonly found in furniture containing polyurethane foam. It is also used as a flame retardant in many other applications such as electronics, textiles, and carpet (#1). It has been listed on California's list of carcinogens since 1992 and New York has recently banned its use in products intended for children under three years of age because of evidence of adverse health effects (#3, #4).

Chemical Description

TCEP is a pale yellow liquid with a slight odor (#5).



Use

TCEP is added to polyurethane foams found in furniture, carpet backing, flame-resistant paint, resins, electronics, textiles and some types of particle board (#4, #6).

History and Regulation

TCEP was added to the California list of carcinogens in 1992 (#3). In 2010, the European Union listed TCEP as a Substance of Very High Concern due its reproductive toxicity and potential to impair fertility (#1). Most recently, New York has passed a law that will ban the use of TCEP in products intended for children under the age of three due to the weight of evidence that suggests TCEP causes adverse health effects (#3).

Routes of Exposure and Metabolism

The flame-retardant TCEP is not an integral component of foam in furniture and can escape into the air over time. Once in the air, TCEP can be inhaled or attach to house dust and eventually settle on food or toys. Dust is frequently ingested accidentally, especially by young children who put their hands and toys in

their mouths more often than adults. TCEP has been found in indoor air and dust in many settings including homes, offices, libraries, and hospitals (#2, #7, #8, #9).

Human Health Effects

Although there is little direct information on the health effects of TCEP, there are several animal studies that suggest exposure may cause adverse impacts. In a study examining reproductive health in mice, TCEP impaired the sperm quality of males, and exposed mating mice had fewer pups and fewer litters (#10). Another study found that exposure to TCEP increased tumors in the kidneys, and brain damage was observed (#11). Brain damage was observed in another experiment. The researchers also found that the exposed rats had learning impairments as well (#12).

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