Maine Department of Environmental Protection

Department Rule Chapter 886

Designation of Mercury as a Priority Chemical and Regulation of Mercury in Children's Products

Basis Statement

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INTRODUCTION

The objective of Maine Law *Toxic Chemicals in Children's Products,* Title 38 M.R.S.A. §§1691 - 1699-B, is to reduce exposure of children and other vulnerable populations to chemicals of high concern by substitution of safer alternatives when feasible, as set forth in the Legislature's Declaration of Policy under 38 M.R.S.A. §1692. To accomplish this, the law provides the Department of Environmental Protection ("Department") the regulatory authority to collect information on chemical use and, if applicable, prohibit the sale of children's products containing priority chemicals when safer alternatives are available.

The law requires that a substance meet certain criteria to be designated a priority chemical, and that the Department provide its findings in support of such a designation. This document sets forth such findings of fact supporting the designation of mercury as a priority chemical, and is intended to serve as the Basis Statement for the designating rule, Chapter 886, *Designation of Mercury as a Priority Chemical and Regulation of Mercury in Children's Products*. Department rule Chapter 880, *Regulation of Chemical Use in Children's Products,* establishes routine technical rulemaking as the process by which the Department may designate priority chemicals.

Although mercury is found widely in the environment and most prevalently in certain types of foods, the exposure of children to mercury through the products they use has been of concern at both the state and federal levels.

Therefore, the Department proposed a reporting rule for certain categories of consumer products in order to determine where mercury may be present in children's products currently available for sale in the State of Maine. Through this rulemaking, the Department designates mercury and mercury compounds (registered Chemical Abstract Service number 7739-97-6, as noted on Maine's Chemical of High Concern list) as a priority chemical in accordance with 38 M.R.S.A. §1694 and establishes a reporting requirement for manufacturers offering certain children's products for sale in the State of Maine.

I. MERCURY BACKGROUND INFORMATION

Mercury is a naturally occurring metal and exists in three commonly recognized forms: metallic/elemental mercury, inorganic mercury, and organic mercury. Metallic or elemental mercury is not combined with other elements. When mercury combines with elements such as chlorine, sulfur, or oxygen it becomes inorganic mercury. Once combined with carbon, mercury compounds become organic or organomercurials. Methylmercury is the organic mercury compound most commonly found in the environment. (ATSDR 1999).

Although mercury use in consumer products has been the subject of considerable scrutiny over the past decade, its use in common household products remains of concern. Most specifically, undisclosed uses of mercury continue in such consumer products as cosmetics and novelties and documentation of detectable levels of mercury used in such products sold in the United States has not been readily available in the public forum.

Health Concerns

Strong, credible scientific evidence leading to exposure concerns includes mercury's classification as *Toxic to reproduction - Category 1A* and *Germ cell mutagen - Category 2* by the Globally Harmonized System of Classification and Labeling of Chemicals ("GHS"). The GHS includes criteria for the classification of health, physical and environmental hazards, and specifies what information should be included on labels of hazardous chemicals, as well as safety data sheets. (QSC 2013).

GHS classifies reproductive toxicity to include adverse effects on sexual function and fertility in adult males and females, as well as developmental toxicity in offspring. Substances with reproductive and/or developmental effects are assigned to one of two hazard categories, "known or presumed" and "suspected." Chemicals classified as Category 1 ("known or presumed to cause effects on human reproduction or on development) are then placed in one of two subcategories, one based on human evidence (Category 1A) and the other subcategory based on experimental animals (Category 1B). (GHS 2006).

GHS classifies germ cell mutagenicity as an agent giving rise to an increased occurrence of mutations in populations of cells and/or organisms. This classification has two hazard categories, Category 2 is defined as a suspected or possible mutagen which may include heritable mutations in human germ cells, positive evidence from tests in mammals and somatic cell tests, and in vivo somatic genotoxicity supported by in vitro mutagenicity. (GHS 2006).

The risk of mercury exposure to children includes when metallic mercury is not safely contained, when mercury is brought into the home through occupational sources, or through methylmercury-contaminated foods (ATSDR 1999). Harmful health effects recorded in children from exposure to mercury are similar to those seen in adults. Exposures to mercury vapors may

cause lung, stomach, and intestinal damage. Metallic mercury easily vaporizes at room temperature. The higher the temperature, the more vapors are released. (ATSDR 2011).

Jewelry items are among the most commonly ingested products by young children. Data on ingested objects is found in a 1998 study that evaluated 100 children ages 9 months to 13 years. Ingested objects included such foreign bodies as coins, jewelry, toys, nails, screws, tacks, or bolts (CPSC 2006).

With this in mind, the Consumer Product Safety Improvement Act of 2008 ("CPSIA") has set ASTM F963-11, *Standard Consumer Safety Specification for Toy Safety*, as the standard by which regulated toys must comply. This standard limits the maximum amount of soluble mercury in a surface coating and substrate of a toy to 60 mg/kg (ppm) of mercury (ASTM-F963-11 Table 1).

A child-specific standard for mercury exposure also exists in the form of the European toy safety standard EN 71-3(1994), which limited exposure to mercury from toys for young children at 60 mg/kg per day. This limit is not expressed in terms of body weight, rather it is a daily limit for mercury exposure that has been adjusted to account for the weight of a young child (approximately 16.5 pounds). (CPSC Report 2010).

These standards highlight concern for the potential exposure of children to mercury through the use of commonly available children's products. Due to the considerable lack of information on the current use of mercury in children's products, the Department believes it is important to compel the reporting of this information.

II. STATUTORY PREREQUISITES FOR PRIORITY DESIGNATION

To be included on Maine's list of Chemicals of High Concern ("CHC"), a chemical must have strong, credible scientific evidence classifying it as either a reproductive or developmental toxicant, endocrine disruptor, or human carcinogen. Mercury meets this requirement after having received the highest possible rating of reproductive toxicity as *Category 1A - known human reproductive toxicant* and a *Category 2* rating as a germ cell mutagen by the Globally Harmonized System of Classification and Labeling of Chemicals ("GHS"). Also included in the GHS classification determination for mercury is its listing as a *Category 1 specific target organ/systemic toxicity following single exposure* by inhalation. (GHS 2006).

Maine statute Title 38 M.R.S.A. § 1694 states that the, "commissioner may designate a chemical of high concern as a priority chemical if the commissioner finds, in concurrence with the Department of Health and Human Services, Maine Center for Disease Control and Prevention:

> A. The chemical has been found through biomonitoring to be present in human blood, including umbilical cord blood, breast milk, urine or other bodily tissues or fluids;

B. The chemical has been found through sampling and analysis to be present in household dust, indoor air or drinking water, or elsewhere in the home environment; or

C. The chemical is present in a consumer product used or present in the home."

The statute authorizes the Commissioner to designate chemicals that meet one or more of these criteria as priority chemicals by the adoption of routine technical rules. Mercury meets all three criteria.

A. Priority Designation Biomonitoring Criteria

As noted in Maine Center for Disease Control and Prevention supporting documents for Maine's CHC list (July 2012), three different biomonitoring studies have found mercury to be present in human urine, blood, including umbilical cord blood, or human breast milk (ME-CDC 2013). Urine samples from a representative population of the United States, collected through the National Health and Nutrition Examination Survey ("NHANES"), from the year 2003 through 2008, found detectable levels of mercury in urine for all age groups surveyed (ME-CDC 2013). In addition, inorganic and organic mercury species have been detected in human breast milk samples (ME-CDC 2013, Bose-O'Reilly et al. 2010, Bjornberg et al. 2005), further solidifying the meeting of this criterion.

B. Priority Designation Presence in the Home Environment Criteria

Mercury has also been detected within the home environment. Studies monitoring indoor and outdoor air in New York and New Jersey reported that levels of elemental mercury in apartment buildings were greater than the ambient outdoor air levels (Garetano et al. 2006, Carpi et al. 2001, ME-CDC 2013). These studies provide evidence that mercury and mercury compounds may be present in the home environment.

C. Priority Designation Presence in Consumer Products Used or Present in the Home

Mercury has been measured in consumer products including children's school bags, children's clothing, jewelry, and pet supplies. The Danish Environmental Protection Ministry, Consumer Product Survey No. 94, "*Survey and health assessment of chemical substances in jewelleries,"* confirmed the presence of mercury in jewelry which exceeded 100 ppm (DEPA 2008). Detection of mercury exceeding 100 ppm exceeds EU Statutory Order 627 (2003) which prohibits the import, sale and export of mercury and mercurial products (which contain more than 100 ppm (mg/kg) of mercury) (DEPA 2008).

As of October 2013, some manufacturers reported to the Washington State Department of Ecology ("WDOE") mercury is either present as a contaminant or had been intentionally added to 30 children's products, as defined by Washington rule Chapter 173-334 WAC. Reported information describes mercury's use as a germicide, texture, stabilizer, and preservative. The

product categories reported include, clothing, bed frames, toy vehicles, shoes, sportswear, toys and games.

This evidence of use in consumer products, more specifically regulated children's products, supports the Department's concern that mercury may be used in ways that are of concern and currently unknown to the public.

III. PURPOSE OF PRIORITY DESIGNATION

The presence of mercury has been confirmed in commonly used children's products through investigative efforts at the federal and state levels, and most recently through the limited manufacturer reporting requirement by the Washington State Department of Ecology. The Department now seeks to gain insight into the current use of mercury in children's products sold within the State of Maine to analyze whether additional regulatory management would be appropriate.

Designating mercury as a priority chemical within the Safer Chemicals Program will provide full disclosure on how and where mercury is used in various consumer product applications. This rule will provide a broader spectrum of information on the use of mercury in manufacturing processes and products available to the Maine consumer thus providing more comprehensive details regarding mercury's use than has been gleaned from any public source.

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