



Consumer Products and Health

Issue

Chemicals in our environment are the subject of increasing public interest. Some products are potentially harmful to the health of Canadian consumers as a result of the chemicals they contain. Children are more susceptible to the harmful effects of certain chemicals than adults. The Government of Canada regulates chemicals in consumer products according to the hazards they may pose. However, it is still important to be aware of the risks associated with consumer products so that further steps can be taken to protect human health.

Background

Canadians use or come into contact with hundreds of consumer products each day. Such products improve our quality of life in many ways, including by helping to meet basic needs such as food, clothing and shelter, and by supporting good hygiene and disease prevention.

Some chemicals benefit or do not affect human health, whereas others have the potential to harm health. This potential to harm depends on a number of factors, such as:

- the amount of chemical to which an individual is exposed – exposure to a large amount is a greater concern than exposure to a small amount;
- the duration and frequency of exposure – multiple exposures of varying duration can illicit different hazards/responses than single exposures of varying duration;

- the toxicity of the chemical – exposure to a small amount of a very toxic chemical can be a greater concern than exposure to a large amount of a less toxic chemical;
- a person's individual characteristics – health effects may vary among individuals.

Products of Interest and Related Health Risks

People are exposed to chemicals in consumer products through numerous routes of entry such as: by putting products in their mouths (e.g., children with toys), direct contact with skin and eyes, breathing contaminated indoor air, or inhaling or ingesting house dust. The following are examples of broad categories of consumer products that are of interest from the perspective of health and environment, particularly with respect to children.

■ Toys and other products for babies and children

To minimize a child's exposure to known harmful chemicals, toxic substances are prohibited from use in toys or they are restricted to limited amounts based on known toxicity parameters. For example, excessively toxic, corrosive or irritant substances and sensitizers are not permitted for use in toys. Concern has been raised regarding the safety of phthalates in toys and infant care products. Phthalates are chemical plasticizers commonly used to make soft vinyl products. Exposure to large amounts of phthalates has been shown to affect the liver and kidneys and cause reproductive or birth defects and suspected disruption of the

endocrine (hormonal) system in laboratory animals. However, there is currently no evidence to indicate that exposure to phthalates at current levels in consumer products poses risks to human health. In 1998, Health Canada conducted a review of phthalates in children's products and concluded that a potential health risk could exist when children under one year of age suck or chew on soft vinyl products containing di-isononyl phthalate ester (DINP) on a daily basis for prolonged periods of time. Health Canada then issued guidance to manufacturers, importers, distributors and retailers requesting that they stop marketing teethers and rattles made of soft vinyl and/or those containing DINP. A number of children's toys were withdrawn from the Canadian market due to these concerns.

■ Arts and crafts materials

While lead is restricted in children's paints and in paints applied to pencils, art brushes, toys, children's furniture and other children's articles, it may be present at higher levels in some paints, glazes and other surface coating materials used for the purposes of arts, crafts and hobbies which are not intended for use by children. Artists' paints containing more than the allowable level of lead must carry precautionary labelling which states that the product contains lead and should not be applied to surfaces accessible to children and pregnant women. Many artists' paints may also contain cadmium and chromium pigments; these too must carry warning labels.

Lead is a soft, heavy metal which is very toxic, especially to children. Exposure to high levels of lead may cause stomach cramps, nausea, vomiting, headaches, and eventually seizures, coma, and death. Lead builds up in the body, and long-term exposure to even very low lead levels can damage the brain and nervous system, resulting in learning disabilities and growth delays. It can also cause other serious health effects, including anemia and kidney damage. Young children can be exposed to lead when they chew, suck, or swallow objects containing lead, or handle surfaces covered in lead-containing dust.

Exposure to high amounts of cadmium can cause abdominal pain, burning sensation, nausea, vomiting, diarrhea, muscle cramps and dizziness. Continued exposure to low amounts of cadmium can cause kidney damage and fragile bones. Studies in animals show that exposure to high amounts of cadmium during pregnancy causes behavioural and learning disabilities in the young.

Similarly, the use of materials that release chemical solvents should be carefully managed. Examples of these products can include oil-based paints, paint thinners and brush cleaning products, permanent markers and white-board markers, and glues. Products containing potentially hazardous chemicals are required to have information on the label for safe use of the product. The potential for health effects can be minimized or avoided if the safety information on the label is followed. These products should be used in well-ventilated areas and, when not in use, tightly covered to prevent evaporation into the air.

■ **Jewellery**

In the past, lead was detected in inexpensive costume jewellery being sold in Canada. The *Children's Jewellery Regulations* under the *Hazardous Products Act* restricts the level of total and migratable lead in children's jewellery.

■ **Furniture, non-clothing textiles, electronics and foam products**

Polybrominated diphenyl ether flame retardants (PBDEs) are added to some plastics, electrical and electronic equipment (e.g., TVs, appliances), upholstered furniture, non-clothing textiles (e.g., curtains) and foam products. PBDEs are added to these products to meet stringent fire safety requirements and are beneficial in reducing risks from fires. PBDEs have been found both in the environment and in humans, including in human breast milk in Canada, the United States and Europe. While the levels in humans are very low, they have been increasing with time, and are higher in North Americans than in Europeans. In the few studies of humans exposed to PBDEs, there is no clear evidence of any adverse effects. In animals, effects on behavioural development, nervous system development, as well as on the liver and thyroid have been seen in studies on rats and mice exposed to PBDEs. However, the experimental animals were exposed at much higher levels than those to which humans are exposed in Canada.

As Environment Canada has concluded that PBDEs pose a risk to some environmental organisms, the Government of Canada recently proposed regulations to prohibit uses of six PBDEs.

■ **Cosmetics, fragrances, personal care products**

Cosmetics and personal care products such as nail polish, hair spray, hair dyes, deodorants, skin creams, perfumes and aftershaves contain various substances that are the subject of increasing public interest. Cosmetic products are intended to be placed on the body and therefore must meet a higher degree of safety compared to other consumer products. Manufacturers and importers cannot sell cosmetics containing substances that cause harm to the user. In addition some cosmetics are also required to have directions for safe use, display hazard symbols and safety information on their label

and, in some cases, child-resistant packaging. An estimated 2 to 5 percent of adults may experience reactions to the chemicals in cosmetics. The most common reaction is a skin rash. When this happens, most individuals simply stop using the product and the condition clears up on its own. However, a small percentage of reactions are more serious and may result in a reduced quality of life, loss of income or school time, increased health risks and increased demands on the health system. Examples of such adverse reactions to cosmetics include painful eye irritations, swelling of the face, hair loss and increased sensitivity to chemicals. Also, some cosmetics are not suitable for children and may even be toxic if swallowed. Health Canada receives more than 50 reports per year about adverse reactions to cosmetics, while many more cases go unreported. As of November 2006, the outer label of cosmetic products sold in Canada must list all the ingredients in the product. This allows people to avoid certain ingredients to which they may be sensitive, or have concerns about.

■ **Food and beverage storage containers and packaging**

Lead and cadmium are sometimes used as pigments in glazes on ceramic and glassware products, and can be released into food or beverages contained in these products. The Government of Canada allows the import, advertisement or sale in Canada of glazed ceramics and glassware products intended for food or beverage use only if the products do not release more than trace amounts of lead or cadmium. However, glazed ceramics and glass products purchased abroad may release hazardous amounts of lead or cadmium. Use glazed ceramic or glassware products for cooking, serving, or storing food or beverages only if you are sure they do not contain hazardous amounts of lead or cadmium.

Some foods come packaged in materials (e.g., styrofoam) that may not be suitable for use in the microwave. These materials could release chemicals into your food or cause burns if they melt during microwave cooking. It is important to remove plastic wrap, freezer cartons, and/or styrofoam trays from contact with food before defrosting or cooking food in a microwave.

Concern has also been expressed about the potential release of bisphenol A into food or beverages. Bisphenol A is a chemical used in the manufacture of clear hard (polycarbonate) plastics, such as that used to make baby bottles, sippy cups and water bottles, which is suspected of having harmful effects on the human endocrine (hormone) system. However, bisphenol A is virtually completely consumed during the manufacturing process, and only very small residual levels may be found in the finished product. Analysis and testing conducted by Health Canada in 2000/2001 on plastic baby feeding bottles and other plastic products showed that the levels of bisphenol A in these products were exceedingly low, and did not present a risk to Canadian children. Health Canada's investigation also showed that although low amounts of bisphenol A could migrate from the plastic into milk, it would do so only under conditions of extreme use. Under normal conditions, it is estimated that the exposure to bisphenol A from plastic baby feeding bottles would be about 1000 times below the current lowest acceptable daily intake level for bisphenol A. These results suggest that plastic products do not pose a health risk if used properly.

■ **Household cleaners**

Kitchen and bath cleaners, air fresheners, laundry and dishwashing detergents, bleach, carpet cleaners, window cleaners, disinfectants and other household cleaners may release potentially harmful chemicals into indoor air. Inhalation of vapours from the use of these products is a main route of exposure, but exposure also can occur when people come into contact with surfaces or materials that have been treated with such products or by directly absorbing the products through their skin during use. Exposures have also been known to occur through unintentional ingestion of a chemical product.

For example, solvents, cleansers and aerosol propellants can release chlorinated hydrocarbons into the air. Chlorinated hydrocarbons are absorbed into the body principally by inhalation, but also through the skin and gastro-intestinal tract; they tend to accumulate in fatty tissues such as the brain, bone marrow and body fat. Recovery from the acute effects of exposure to the chlorinated hydrocarbons is usually complete, but, after repeated exposures, adverse health effects may include depression of, or permanent damage to, the central nervous system, irritation of the eyes and lungs, and damage to the skin, liver and kidneys. In the home, exposures are generally of short duration, but levels may be sufficiently high which may lead to adverse health effects.

Where consumer chemical products, such as household cleaning products, contain potentially harmful chemicals, they are required to display hazard symbols and safety information on their label and, in some cases, child-resistant packaging. These requirements are set out in the *Consumer Chemicals and Containers Regulations, 2001 (CCCR, 2001)* issued under the *Hazardous Products Act*. By reading and following the safety information and other

manufacturer directions for use, this will help change your behaviour towards the use and storage of consumer chemical products, which will ultimately help to minimize negative health impacts.

■ **Clothing and building materials containing formaldehyde**

Formaldehyde is used as a disinfectant and preservative. It is used in textile finishing and in the production of resins that act as adhesives and binders for some building materials, such as pressed wood products, pulp, paper, glasswool and rockwool, as well as some plastics, coatings, paints and varnishes, and industrial chemicals.

Many of the products found inside Canadian homes contain and release very small amounts of formaldehyde into the air. Examples include:

- furniture, cabinets and building materials made from particleboard, medium density fibreboard and certain moulded plastics;
- latex paints, wallpapers, cardboard and paper products, dishwashing liquids, fabric softeners, shoe-care agents, carpet cleaners, glues, adhesives, lacquers and some cosmetics, such as nail polish and nail hardener;
- some permanent press fabrics (e.g., certain curtains, sheets, clothing, etc.).

Although the amounts of formaldehyde released by each of these sources are usually small, the sum of all sources can lead to formaldehyde concentrations exceeding Health Canada's current guidelines, especially in homes that are not sufficiently ventilated.

Exposure to moderate levels of formaldehyde can cause a number of irritant symptoms, including temporary burning of the eyes or nose, and a sore throat. Evidence indicates that formaldehyde can bring on symptoms of asthma in susceptible individuals. It is a good idea to follow some simple steps that will help lower your exposure to formaldehyde such as washing permanent press clothes before you use them and ensuring adequate ventilation when using other consumer products and building materials containing formaldehyde.

■ **Home maintenance products**

While the use of lead in the production of interior paint has been phased out in Canada, some homes built before the 1970s may still have original lead-based paint showing on various surfaces, such as walls and window sills. Once applied to these surfaces, lead-based paint does not pose a health hazard if it is in good condition and is not disturbed. A concern arises when the paint surface shows signs of chipping or flaking, which can lead to children chewing on these chips or flakes, and thus ingesting lead. Even small amounts of lead can be harmful, especially to infants, young children and pregnant women.

Paint strippers are handy during home renovations, but some contain methylene chloride. Methylene chloride can be hazardous to human health. When exposed over a long period of time to high levels of this chemical, lab animals developed cancer. Scientists believe that prolonged exposure could cause cancer in humans as well. In addition, when methylene chloride breaks down in the body (metabolizes) it results in carbon monoxide exposure, which can cause cardiovascular stress. As a result, careful use is required, including use in well-ventilated areas. Alternative paint strippers may contain N-methyl pyrrolidone (NMP), esters, limonene, mixed alcohols or hydrocarbon solvents. These too should be used in well-ventilated areas.

Paints, varnishes, stains and other home maintenance products can also pose potential risks to human health as described in the “Arts and Crafts Materials” section above. All of these products are required to be properly labeled and packaged under requirements set out in regulations made under the authority of the *Hazardous Products Act*.

Minimizing Your Risk

The following are some general tips on how to reduce potential risks to human health posed by the chemicals found in consumer products:

- **Buy and use wisely:** It is important to consider the potential risks when deciding which products to buy. Following manufacturer’s instructions on the appropriate use and storage of products can help reduce health risks. Since some products such as paints and paint thinners can release potentially hazardous substances into the air during storage, it is wise to buy only as much as you really need. Reducing your household inventory of unnecessary consumer chemical products can also help reduce the likelihood of unintentional exposure by children.
- **Clean your home regularly:** Many of the chemicals found in consumer products can end up in house dust. It is important to wet dust (dusting with a damp cloth rather than a dry cloth, which can disperse dust rather than remove it) and vacuum floors and rugs frequently, particularly if you have young children. Having people take off their shoes before entering the house can help prevent tracking in certain contaminants that might be found outside the home, such as pesticides from treated lawns.

- **Wash permanent press clothing and sheets before you use them,** and air out products such as permanent press drapes before bringing them into your home to limit exposure to formaldehyde.
- **Keep hands and toys clean:** Since house dust is a major route of exposure to potentially hazardous contaminants in the home, washing your children’s hands and toys often will help reduce the amount of dust they ingest through hand-to-mouth activities. It is not necessary to use anti-bacterial soap products – warm water, regular soap and at least 20 seconds of gentle scrubbing is sufficient.
- **Cook and store food safely:** Use cookware, food containers and wraps only as they are intended to be used. Don’t use plastic bowls or wrap in the microwave unless they are labelled as microwave-safe. Try waxed paper instead of plastic wrap for covering food in the microwave and for storing food. Use glass food storage vessels, when possible, particularly for acidic or fatty foods.
- **Clean “green”:** A few common household substances can be used for a range of house-cleaning tasks, reducing or eliminating the need for chemical-containing products. Baking soda, a mild abrasive and powerful deodorizer, can be used for cleaning sinks and tubs instead of scouring powders or spray cleaners. A solution of vinegar and water can be used to wash windows and mirrors, eliminating hazardous exposures and saving money at the same time.
- **Ventilate your home:** When painting or doing other home maintenance or craft projects involving chemicals, make sure you have proper ventilation by opening all windows and setting up fans to blow the vapours outside. If you can, do the project outside. If you are pregnant, avoid using solvent-containing products, including paints, paint strippers, certain glues and adhesives, nail polish and certain household cleaning products such as spot removers.

The Government of Canada's Role

■ Consumer products

Health Canada's Product Safety Programme provides information to consumers through publications which help increase awareness of the hazards and actions to take to use products safely during reasonably foreseeable use. This involves setting out the criteria for manufacturers and importers to classify, label and package their products. These criteria take into consideration the hazard of the product and the potential risks of using the product. Health Canada also investigates consumer complaints about the safety of products, and has the authority to take products off the market for safety reasons, when necessary.

The *Hazardous Products Act* and associated regulations prescribe action and/or prohibit specific products or materials, for example:

- the *Consumer Chemicals and Containers Regulations, 2001* requires labelling and packaging of consumer chemical products.
- lead and mercury limits for paints and other surface coating materials are prescribed in the *Surface Coating Materials Regulations*.
- heavy metal limits for applied surface coating materials are defined for toys, equipment and other products for use by a child in learning or play.
- balloon-blowing kits for children that contain any organic solvent are prohibited.
- limits of lead and cadmium in glazed ceramics and glassware are set in the *Hazardous Products (Glazed Ceramic and Glassware) Regulations*.

In addition to these and other regulatory instruments, there are some voluntary agreements in place to improve on the safety of consumer products. For example, agreements on formaldehyde limits in particleboard and the "Green Label" program for reducing volatile organic compound (VOC) emissions from carpets (and other textile floor coverings).

■ Cosmetics

Health Canada defines and communicates requirements concerning the manufacturing, labelling, distribution and sale of cosmetic products in Canada. All cosmetics sold in Canada must meet the requirements of the *Food and Drugs Act*, the *Cosmetic Regulations*, and all other applicable legislation to ensure that they are safe and do not pose health risks when used as directed. Health Canada regularly reviews the safety of ingredients in cosmetics and maintains a Cosmetic Ingredient Hotlist, which is a list of prohibited and restricted cosmetic ingredients in Canada. If a substance is found to pose a risk to health, it is added to the Hotlist and all companies must ensure their cosmetic formulations adhere to this list. As of November 2006, the outer label of cosmetic products sold in Canada must list all the ingredients in the product.

■ Chemicals

Health Canada and Environment Canada work together to assess and manage the potential health and environmental risks posed by commercial substances, as mandated by the *Canadian Environmental Protection Act, 1999* (CEPA 1999).

Need More Info?

More information can be found at
www.chemicalsubstances.gc.ca

It's Your Health
www.healthcanada.gc.ca/iyh

Arts and Crafts Materials
www.hc-sc.gc.ca/iyh-vsv/prod/arts_e.html

Cookware
www.hc-sc.gc.ca/iyh-vsv/prod/cook-cuisinier_e.html

Cosmetics
www.hc-sc.gc.ca/iyh-vsv/prod/cosmet_e.html

Lead-based Paint
www.hc-sc.gc.ca/iyh-vsv/prod/paint-peinture_e.html

Lead Crystalware
www.hc-sc.gc.ca/iyh-vsv/prod/crystal_e.html

Paint Strippers
www.hc-sc.gc.ca/iyh-vsv/prod/strippers-decapants_e.html

Formaldehyde and Indoor Air
www.hc-sc.gc.ca/iyh-vsv/environ/formaldehyde_e.html

Polybrominated diphenyl ether flame retardants
www.hc-sc.gc.ca/iyh-vsv/environ/pbde_e.html

Children's Jewellery Containing Lead
www.hc-sc.gc.ca/cps-spc/pubs/cons/jewellery-bijoux_e.html

Consumer Chemicals and Containers Regulations, 2001
www.hc-sc.gc.ca/cps-spc/legislation/acts-lois/consumerchemicals_e.html

Microwave Ovens and Food Safety
www.inspection.gc.ca/english/fssa/concen/tipcon/microe.shtml

Consumer Product Safety – Health Canada
www.healthcanada.gc.ca/cps

You can also call Health Canada toll free at
1-866-225-0709 or TTY at 1-800-267-1245