



NAPHTHALENE IN INDOOR AIR

Naphthalene belongs to a group of chemicals called polycyclic aromatic hydrocarbons. These chemicals are found in fossil fuels and are also formed as by-products of the combustion of biomass and fossil fuels. Naphthalene usually occurs in solid form, but can also be released as a gas to indoor air at room temperature. Most of the exposure to naphthalene occurs through breathing air in the home and other buildings.

Indoors, naphthalene is found in consumer and building products such as air fresheners, paints, stains, flooring and carpeting, as well as in some pest control products (mothballs and moth flakes). Naphthalene can also be released from combustion sources in the home such as woodstoves and fireplaces, and from cooking. It can enter the home from exhaust from vehicles and gas-powered equipment in attached garages, and is found in cigarette smoke.

What are the health effects of naphthalene?

Naphthalene has been shown to cause tissue damage and cancer in the nasal passages and lungs of rats and mice exposed to high levels in laboratory studies. It is seen as a possible carcinogen for humans, although there is not sufficient evidence to conclude that it causes cancer in humans.

Naphthalene may also cause the abnormal breakdown of red blood cells in susceptible individuals, a condition known as hemolytic anemia. These reports are not common and are usually associated with accidental swallowing or sufficient exposure to mothballs or mothball-treated fabrics. People with a genetic condition that causes them to be deficient in a specific enzyme that protects red-blood cells from naphthalene (G6PD deficiency) are particularly susceptible. This condition affects approximately 5% of the population worldwide. In addition, infants, with or without this deficiency, may develop hemolytic anemia if exposed to sufficiently high levels of naphthalene.

The levels of naphthalene in most Canadian homes are below the recommended limit in Health Canada's Residential Indoor Air Quality Guideline, meaning that exposure to the very low amounts of naphthalene found in most homes will not affect health. Naphthalene exposure should be controlled as much as reasonably possible; however, indoor air sampling is neither practical nor recommended in most situations.

How can you reduce naphthalene levels indoors?

By following these simple steps you will not only reduce naphthalene levels in your home but you will also reduce the levels of other pollutants and will improve your indoor air quality:

- Do not allow smoking in your home.
- Wood-burning stoves and fireplaces in your home should be well maintained and properly vented directly to the outdoors.
- Properly store gasoline or other fuels; it is best if you do not store fuels in your home.
- Properly store naphthalene moth control products (mothballs and moth flakes) and always keep these products, whether in storage or in active use, out of reach of children and pets.
- Before using naphthalene moth control products, read the label. Follow the directions carefully.
- Before using any clothing or fabric items that have been stored with mothballs, completely and thoroughly air them outdoors (preferably in direct sunlight) in an area not accessible to children or pets, and always wash them before use.
- Properly store chemical products that may contain naphthalene (e.g., paints, varnishes) in tightly sealed containers away from the occupied areas of the house. Always keep these products out of reach of children.
- Increase ventilation, by opening doors and windows, and follow all label recommendations when applying paints and varnishes in your home.
- Do not run cars or other gasoline-powered engines in an attached garage and ensure that any doors between the garage and your home are properly sealed and kept closed when not in use.

What are Health Canada's recommended levels for naphthalene indoors?

Health Canada's Residential Indoor Air Quality Guideline for naphthalene recommends a maximum long-term exposure limit below which no negative health effects should occur of:

- Long term exposure: 0.0019 parts per million (0.010 mg/m³).

Average naphthalene concentrations in Canadian homes range from 0.0003 to 0.0063 mg/m³, which is below the guideline value of 0.010 mg/m³ established by Health Canada. Therefore, naphthalene is not a health concern in most homes.

What are Residential Indoor Air Quality Guidelines and Guidance Documents?

The Residential Indoor Air Quality Guidelines are Health Canada's assessment of the health risks posed by an indoor air pollutant, based on a review of the best scientific information available. They summarize the known health effects, describe indoor sources and levels, and provide a recommended exposure level below which health effects are unlikely to occur. When a numerical exposure limit cannot be derived from the available scientific evidence, a Residential Indoor Air Quality Guidance Document is developed that focuses on actions to reduce exposure.

The Guidelines and Guidance Documents are recommendations only and are not an enforceable standard under any regulation. They are meant to serve as a scientific basis for activities to reduce the risk from indoor pollutants. This could include the development of regulations or standards or the production of communication materials aimed at the general public.

Where do I go for more information?

Health Canada's Residential Indoor Air Quality Guidelines and Guidance documents can be obtained from: www.hc-sc.gc.ca/ewh-semt/air/in/res-in/index-eng.php or by contacting Health Canada at: air@hc-sc.gc.ca

Labeling and packaging requirements for naphthalene-containing mothballs can be obtained from <http://www.healthycanadians.gc.ca/recall-alert-rappel-avis/hc-sc/2012/13669a-eng.php>.

If you have any questions about the Guidelines, the Guidance Documents or would like to discuss using them in your work please contact Health Canada at: air@hc-sc.gc.ca.

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