



Naphthalene

General Information

Key Points

- naphthalene is a white crystalline solid
- it is present in coal tar which is the liquid by-product of the distillation of coal into coke
- produced when burning fossil fuels, wood and tobacco
- used as a raw material to produce phthalic anhydride which is used to produce some dyes, plasticizers, insecticides and some pharmaceutical products
- its use as a fumigant in moth balls and soil has been banned since 2008
- exposure and ingestion can cause nausea, vomiting, pain in the abdomen, diarrhoea, confusion, sweating, fever, fast heart rate, rapid breathing and may lead to convulsions, coma and possibly death
- blood may be present in the urine 3-5 days after exposure
- naphthalene may possibly cause cancer

Public Health Questions

What is naphthalene?

Naphthalene is a white, crystalline solid which is flammable, and has an aromatic odour of mothballs.

What is naphthalene used for?

Naphthalene is the most abundant component of coal tar, which is the liquid by-product of the distillation of coal into coke for use as a smokeless fuel.

The most common current use for naphthalene is as a raw material in the production of phthalic anhydride, which is commonly used in the production of dyes, plasticizers, insecticides and some pharmaceutical products.

In the past, naphthalene was used as a fumigant for repelling moths, for which it is popularly known as mothballs. Another classical use of naphthalene was as a fumigant for soil. Such uses are now discontinued.

How does naphthalene get into the environment?

Naphthalene does not occur naturally in the environment, hence is most likely to enter the environment from workplaces where it is manufactured or used. Naphthalene may be also released into the environment due to burning organic material such as fossil fuels, petroleum and wood. Smoking cigarettes and tobacco will also release small quantities of acrylonitrile into the environment.

How might I be exposed to naphthalene?

Exposure to naphthalene is most likely to occur in an occupational setting. However, the general public may be exposed to naphthalene through inhalation of smoke from burning fossil fuels or wood, or from inhaling vehicle exhaust fumes. The general public may also be exposed to naphthalene by breathing in cigarette smoke.

Its use in household preparations such as mothballs has been replaced and therefore, such exposure in the home is now less common.

If I am exposed to naphthalene how might it affect my health?

The presence of naphthalene in the environment does not always lead to exposure. In order for it to cause any adverse health effects, you must come into contact with it. You may be exposed by breathing, eating or drinking the substance or by skin contact. Following exposure to any chemical, the adverse health effects that you may encounter depend on several factors, including the amount to which you are exposed (dose), the way you are exposed, the duration of exposure, the form of the chemical and if you were exposed to any other chemicals.

Breathing fumes containing naphthalene, drinking solutions or swallowing solid naphthalene can cause nausea, vomiting, pain in the abdomen, diarrhoea, confusion, sweating, fever, fast heart rate, rapid breathing and may lead to convulsions, coma and possibly death.

Approximately 3-5 days after a severe exposure to naphthalene, blood may be present in the urine and may be dark brown in colour, caused by breakdown of the red blood cells, leading to kidney failure.

Skin contact with naphthalene can cause skin irritation and could possibly cause inflammation of the skin, with redness, swelling, pain and itching.

Exposure of the eyes to naphthalene may result in irritation, damage to the cornea and may lead to the formation of cataracts.

Can naphthalene cause cancer?

The International Agency for Research on Cancer (IARC) has concluded that there is enough evidence in experimental animals, but not in humans that prolonged exposure to naphthalene can cause cancer. Therefore they have classified naphthalene as possibly having the ability to cause cancer in humans.

Does naphthalene affect pregnancy or the unborn child?

Available evidence does not indicate that exposure to naphthalene during pregnancy will have a direct effect on the unborn child. However, if the exposure to naphthalene causes the mother to become unwell this may affect the health of the unborn child.

How might naphthalene affect children?

Children are more sensitive to the effects of naphthalene than adults.

Are certain groups more vulnerable to the harmful effects of naphthalene?

People with a hereditary deficiency of glucose-6-phosphate dehydrogenase (G6PD) are particularly susceptible to naphthalene exposure.

What should I do if I am exposed to naphthalene?

You should remove yourself from the source of exposure.

If you have got naphthalene on your skin remove soiled clothing (not above the head), wash the affected area with lukewarm water and soap for at least 10–15 minutes and seek medical advice.

If you have got naphthalene in your eyes remove contact lenses, wash the affected area with lukewarm water for at least 10–15 minutes and seek medical advice.

If you have inhaled or ingested naphthalene seek medical advice.

Additional sources of information

NHS Choices – Poisoning: <http://www.nhs.uk/Conditions/Poisoning/Pages/Introduction.aspx>

UKTIS. Best Use of Medicines in Pregnancy <http://www.medicinesinpregnancy.org/>

This information contained in this document from the PHE Centre for Radiation, Chemical and Environmental Hazards is correct at the time of its publication.

First published: November 2017

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