Public Health England

Protecting and improving the nation's health

Acrylamide

General Information

Key Points

- acrylamide is also known as vinyl amide and acrylamide monomer
- it is a colourless, odourless solid
- acrylamide is an important industrial chemical
- it can be released into the environment during its production and use
- the general public may be exposed to low amounts via ingestion of food (as it is produced naturally in foods cooked at high temperatures) and via cigarette smoke
- breathing in dust or vapours of acrylamide for a short period of time can cause sore throat and cough
- ingestion of large amounts of acrylamide may cause burning and ulceration of the mouth and throat and stomach upset
- skin contact can lead to irritation, numbness, tingling, sweating, itchy rash and peeling
- acrylamide may be able to cause cancer in humans
- acrylamide may harm the unborn child

PHE publications gateway number: 2014790

Published: May 2017

Public Health Questions

What is acrylamide?

Acrylamide is a colourless, odourless solid. Other names for acrylamide are vinyl amide and acrylamide monomer.

What is acrylamide used for?

Acrylamide is an important industrial chemical that is used to produce polyacrylamides, which are used as cleaning agents in water treatment processes. Acrylamide is also used as a grouting agent and to produce dyes and other industrial chemicals.

How does acrylamide get into the environment?

It can enter the environment during its production and use.

How might I be exposed to acrylamide?

For the general public exposure to acrylamide may occur via ingestion of food. Acrylamide is not added to food but forms naturally when foods with a lot of starch are cooked at high temperatures (over 120ºC) by processes such as frying, roasting or baking. It is formed and found in a wide range of foods such as potatoes, root vegetables, toast, crisps, biscuits, cereals and coffee. Typically the higher the temperatures and the longer the cooking process, the more acrylamide may be formed. For more information on acrylamide in food please see the Food Standards Agency website http://www.food.gov.uk/science/acrylamide.

Drinking water may also be a source of exposure to very small amounts of acrylamide. In the UK acrylamide levels are under stringent control and exposures to acrylamide in water are reduced to the lowest practical level to minimise possible risks to health.

Inhalation of tobacco smoke, including second hand smoke, can result in exposure to acrylamide.

Exposure to acrylamide can also occur in an occupational setting during its production and use. However, safe limits are enforced to protect the employees; such levels are below those that are thought to cause harmful effects.

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

The presence of acrylamide 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 to acrylamide by breathing, drinking, eating or by skin contact with it. Following exposure to any chemical, the adverse health effects 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.

Ingestion of amounts of acrylamide as may be found in the diet is not expected to cause short term health effects. Ingestion of larger amounts can cause burning and ulceration of the mouth, and throat and stomach upset. Breathing in acrylamide dust or vapours can cause sore throat and cough. Skin contact with acrylamide may lead to irritation, numbness, tingling, sweating, itchy rash and peeling of skin. Eye contact with acrylamide can cause irritation. Short term exposure to high concentrations acrylamide can also cause confusion, hallucinations, fitting and heart problems.

Long-term exposure to acrylamide can cause tiredness, muscle weakness, memory loss, slurred speech, weight loss and numbness of limbs. However, it is unlikely that the general public would be exposed to levels high enough to cause these effects.

Can acrylamide 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 acrylamide can cause cancer. Therefore they have classified acrylamide as probably having the ability to cause cancer in humans.

Does acrylamide affect pregnancy or the unborn child?

There is limited evidence in animals to suggest that acrylamide may be toxic to the reproductive system. However, the level of exposure to acrylamide in food would not be expected to increase the risk of effects on reproduction.

Generally, effects to the unborn child are less likely following exposures to acrylamide which do not harm the mother.

How might acrylamide affect children?

Children exposed to acrylamide would be expected to show the same symptoms as adults.

What should I do if I am exposed to acrylamide?

For more information on acrylamide in food please see the Food Standards Agency website http://www.food.gov.uk/science/acrylamide

If you have any health concerns regarding other exposures to acrylamide seek guidance from your GP or contact NHS 111.

Additional sources of information

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

NHS Choices – Starchy foods and carbohydrates: http://www.nhs.uk/Livewell/Goodfood/Pages/starchy-foods.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: May 2017

For queries relating to this document, please contact: generaltox@phe.gov.uk