Public Health England

Protecting and improving the nation's health

Methane

General Information

Key Points

- methane is a colourless, odourless, highly flammable gas
- it is the primary component of natural gas and biogas
- methane is used in homes for cooking, heating and generating electricity
- it is also used as a power source and to produce other chemicals in industry
- it is produced naturally from the decay of natural material such as plant and animal matter
- methane levels are generally low in the atmosphere
- methane is the second most significant greenhouse gas in the UK
- high levels of methane can cause mood changes, slurred speech, vision problems, memory loss, nausea, vomiting, facial flushing and headache
- skin or eye contact with liquefied methane released under pressure may cause frostbite
- low level exposure to methane in the environment or from the correct use of natural gas products appliances would not be expected to cause any adverse health effects

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Public Health Questions

What is Methane?

Methane is a colourless, highly flammable gas which is the primary component of natural gas. It may also be referred to as biogas, or marsh gas. It may be stored and/or transported under pressure as a liquid-gas.

Natural gas is odourless therefore to help people detect any leaks a harmless chemical is added to it to make it easier to smell. It is described as a rotten egg or hydrogen sulphide smell.

What is Methane used for?

Domestic gas in the UK is mostly composed of methane. Being a major constituent of natural gas, methane is used for cooking, and heating. In industry, methane is also used to refine petrochemicals and to produce plastics, fertilisers, anti-freeze and fabrics.

Methane gas from animal and landfill waste is captured and used to generate heat and electricity.

How does Methane get into the environment?

Natural methane is found below the ground and under the sea bed. It is present at lower levels in the Earth's atmosphere. It is produced naturally from the decay of natural material such as plant and animal matter. Sources of methane include wetlands and volcanoes.

Methane may also be formed and released to the environment as a result of human activities. Livestock, manure, leaks from gas distribution networks and landfill waste all represent sources. When released into soil or water methane will eventually escape into the air where it is slow to degrade.

Methane is the second most significant greenhouse gas in the UK. Greenhouse gases trap and hold heat in the atmosphere which warms the Earth's surface.

How might I be exposed to Methane?

Methane is present in the atmosphere; therefore the general public may be exposed to very low levels when breathing in air. Low level exposure to methane can also occur from the use of natural gas products or gas appliances in the home.

Low level exposure from the environment or from the correct use of natural gas products and gas appliances would not be expected to cause adverse health effects.

Occupational exposure to methane may occur in the workplace where it is extracted, produced or used.

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

The presence of methane 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 carbon dioxide by breathing it, or by skin contact with it. Following exposure to any chemical, the adverse health effects by which 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.

Low level exposure from the environment or from the correct use of natural gas products and gas appliances would not be expected to cause adverse health effects.

High levels of methane can reduce the amount of oxygen breathed from the air. This can result in mood changes, slurred speech, vision problems, memory loss, nausea, vomiting, facial flushing and headache. In severe cases, there may be changes in breathing and heart rate, balance problems, numbness, and unconsciousness. If exposure is large or continues for a longer period it can kill.

Skin or eye contact with liquefied methane released under pressure may cause frostbite.

Can Methane cause cancer?

Methane is not thought to cause cancer in humans.

Does Methane affect pregnancy or the unborn child?

There are limited data available on the direct effects of exposure methane on pregnancy and the unborn child. Therefore it is not possible to draw any definitive conclusions. Effects on the unborn child are more likely to occur if the exposure to methane causes the mother to become unwell.

Low level exposure to methane in the environment and from the correct use of natural gas products or appliances would not be expected to harm the mother or the unborn child.

How might methane affect children?

Children exposed to high levels methane are expected to show similar effects to adults.

Methane containing products should be stored out of the reach of children.

What should I do if I can smell gas in the home?

If you can smell gas you should call the National Gas Emergency Number on 0800 111 999

Open doors and windows to ventilate the property.

Put out naked flames and don’t smoke.

Don’t turn off or on any power or light switches

Turn off the meter at the control handle unless the meter is in the cellar

What should I do if I am exposed to Methane?

Low level exposure to methane in the environment or from the correct use of natural gas products and appliances would not be expected to cause any adverse health effects. However, if you have any health concerns regarding exposure to methane seek guidance from your GP or contact NHS 111.

Additional sources of information

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

NHS Choices- Burns and scalds http:// www.nhs.uk/Conditions/Burns-and-scalds/Pages/Introduction.aspx

HSE- Domestic gas health and safety http://www.hse.gov.uk/gas/domestic/index.htm

National Grid gas emergencies and safety advice https://www.nationalgridgas.com/safety-and-emergencies/emergencies-and-safety-advice

Information on greenhouse gases: http://www.environment.gov.au/climate-change/climate-science-data/climate-science/greenhouse-effect

This document from the PHE Centre for Radiation, Chemical and Environmental Hazards reflects understanding and evaluation of the current scientific evidence as presented and referenced here.

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