



## Methane

### Answers to Frequently Asked Questions

#### What is methane?

Methane is a colorless, odorless gas at room temperature. It is extremely flammable (able to be burned) and in poorly vented, closed-in areas, it can cause explosions or suffocation.

Methane is the main component of natural gas. It is used for heating, cooking, and creating electricity. Methane also traps heat inside Earth's atmosphere. This makes it a greenhouse gas.

#### Where does methane come from?

Methane is produced when organic (living) material breaks down and decays. This can be a natural process, or it can be human-related. Major sources of methane include:

- Farms. Animals like sheep, cows, and goats create methane in their stomachs when they digest food. Animal manure storage also produces methane.
- Fossil fuels. Methane is released into the atmosphere during the production, storage, and shipping of natural gas and petroleum.
- Landfills. Decaying food, wood, and paper creates methane in landfills.
- Coal mining. Methane pockets can be trapped in coal mines. The methane is released when the coal is mined.
- Natural sources. This includes wetlands, volcanoes, wildfires, oceans, and termites.

#### How can I come in contact with methane?

Because methane is a gas at room temperature, the most common way methane can enter your body is by breathing it. Most methane will come from the ambient (outdoor) air in very small amounts called background levels. This is the methane released from agriculture, fossil fuels, landfills, coal mining, and natural sources.

A small amount of methane can be dissolved in water. It can be carried by contaminated (polluted) groundwater and enter homes through private water wells used for drinking and food preparation.

If there is a natural gas leak in your home from an oven, water heater, fireplace, or other gas appliance, methane gas may build up in closed-in, poorly vented areas, like a basement.



*Methane in the ambient air comes from many sources, like farm animal manure. (Image source: Wikimedia Commons)*

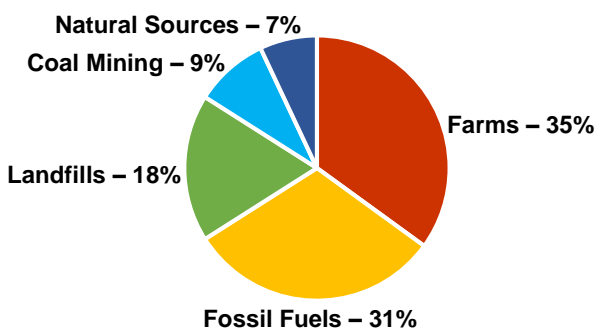
#### Does methane cause health problems?

Methane is not toxic, but it can cause suffocation.

Being trapped in an area filled with methane makes it difficult to breathe enough oxygen. You may feel short of breath, dizzy, or clumsy at first. If you do not get fresh air soon, you may vomit, collapse, pass out, stop breathing, or die. If you are exposed to very high levels of methane, you can have permanent brain damage from the lack of oxygen.

Because methane is extremely flammable, it can easily catch fire or explode, causing burns or death.

#### Where does U.S. methane come from? (2015)



## Does methane cause cancer?

No. Methane is not known to cause cancer.

## How does methane affect children?

Methane can also cause suffocation in children. Because young children are smaller and breathe faster than adults, they may show signs of suffocation quicker than an adult.

## How can I protect myself from methane in my home?

You can protect yourself and your family from methane poisoning and explosion by knowing if you may have a natural gas leak in your home. If your home uses natural gas, use your senses to:

- Smell. Although methane has no smell, a stinky chemical called mercaptan is added to natural gas to help you smell a gas leak. It smells like rotten eggs.
- Hear. Listen for a hissing, whistling, or roaring sound near a gas line or gas appliance.
- See. Look for a damaged connection in a gas appliance, bubbles in water near a gas line, an exposed gas pipeline after an event like an earthquake or flood, and fire near a gas line.

If you smell, hear, or see any of these in your home, you need to:

- Quickly move away from that area. If you are inside your home, move outside. Do not open windows and doors to try to air out your house. If you are outside, turn off any motorized equipment and get away from that area. Make sure anyone in your home leaves with you.
- Call 911. Go to a safe area away from your home to call for help. Report that you may have a gas leak. After you call 911, you may also call your natural gas company.
- Do not use anything that creates fire or sparks where you sense the gas leak. This includes matches, lighters, cell phones, lights, electric appliances, and power tools. A spark can ignite the methane and cause a fire or explosion.

If you are doing yard work or home renovations, always call 811 before you dig to know where underground gas lines may be located.

## How can workers protect themselves from methane in an enclosed space?

The National Institute for Occupational Safety and Health (NIOSH) recommends that workers who are in enclosed, poorly vented areas that contain methane should:

- Use a self-contained breathing apparatus.
- Get fresh air often.
- Use gloves and goggles if you have to touch liquid methane.
- Use explosion-proof tools and lighting, and use non-sparking tools.
- Never smoke, light a match, or use anything that can create sparks while near methane.

NIOSH recommends a maximum safe methane concentration for workers during an 8-hour period of 1,000 parts methane per million parts air (1,000 ppm).



*Methane that builds up with no way to escape can cause fire or an explosion. (Image source: Shutterstock)*

## Resources

EPA. 2010. Methane and Nitrous Oxide Emissions from Natural Sources. U.S. Environmental Protection Agency, Washington, DC, USA.

NIOSH. 2015. International Chemical Safety Cards, Methane. Centers for Disease Control and Prevention, Atlanta, GA, USA.

Columbia Gas Ohio. 2017. Detect natural gas.

## Where can I get more information?

Ohio Department of Health  
Bureau of Environmental Health and Radiation Protection  
Health Assessment Section  
246 N. High Street  
Columbus, Ohio 43215  
Phone: (614) 728-9452