Perchlorate

What you need to know

What is it?

Perchlorate gets its name from an ion — four oxygen molecules bonded to one chlorine molecule. It exists in many forms, both natural and manufactured.

The most common are ammonium perchlorate and potassium perchlorate.

Why do we use it?

Perchlorate provides oxygen to solid rocket fuel, training munitions, fireworks and airbags.

Unlike compressed oxygen, perchlorate is safe, stable, light and easily mixed with solid fuel.

Perchlorate has also been used to treat thyroid gland disorders.

Both potassium and ammonium perchlorate are used in fireworks and other pyrotechnics.

Solid rocket fuel uses ammonium perchlorate.

What is the Army doing?

The Army is actively investigating ways to replace perchlorate with other substances in its products.

So far, the Army has replaced perchlorate in two items used in training: a training hand grenade and an artillery blast simulator. Together, they represent more than three-quarters of the perchlorate used by the Army.

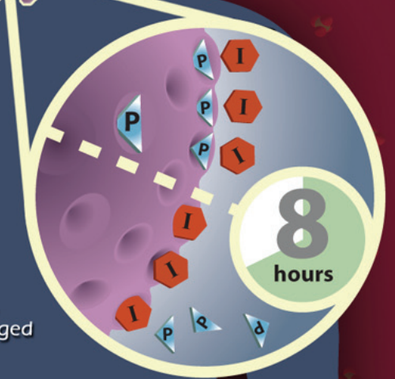
The Army continues to seek ways to replace perchlorate in other products. It is developing new methods for rocket maintenance to minimize the release of perchlorate into the environment. In addition, the Army continues to develop and employ technologies to remove it from the environment.

How does it affect the body?

Perchlorate and the thyroid

The thyroid gland helps regulate the metabolism by releasing hormones. Perchlorate competes and interferes with iodide uptake in the thyroid gland.

Within eight hours, half the perchlorate taken in leaves the body without damage. It is not metabolized or stored in the body.



People, especially those with low hormone reserves, could be affected by prolonged exposure to high levels of perchlorate.

How does it get into the environment?

Perchlorate enters the environment in several ways, primarily during the manufacture, disposal or use of munitions, fireworks or emergency flares. Some perchlorates occur naturally in arid environments. Dispersion depends on the amount of water present. Perchlorate is very soluble, so it can migrate quickly anywhere water goes.

What makes controlling perchlorate a challenge?

- It moves at the speed of groundwater
- It is extremely stable and persistent
- It dissolves more easily than table salt

Perchlorate has been found in some drinking water, vegetables, milk and other consumables.

How much is safe?

- So far, the EPA has not regulated or set a national standard for perchlorate levels in the environment.
- A human could be exposed to up to 0.7 micrograms of perchlorate per kilogram of body weight per day without adverse health effects, according to a 2005 National Academy of Sciences report. Based on this report, EPA calculated that 24.5 ppb in drinking water is a safe level.
- Many states have set their own levels – they range from 18 ppb (Nevada) to 2 ppb (Massachusettes)

What is "part-per-billion?"

A half-teaspoon in an Olympic swimming pool.

For further information

http://www.denix.osd.mil/portal/page/portal/denix/environment/MERIT/

www.tera.org/perchlorate/welcome.htm

www.epa.gov/ogwdw/ccl/perchlorate/perchlorate.html