

US EPA ARCHIVE DOCUMENT

Consumer Factsheet on: BENZO(A)PYRENE

[List of Contaminants](#)

As part of the Drinking Water and Health pages, this fact sheet is part of a larger publication:
National Primary Drinking Water Regulations

This is a factsheet about a chemical that may be found in some public or private drinking water supplies. It may cause health problems if found in amounts greater than the health standard set by the United States Environmental Protection Agency (EPA).

What is Benzo(a)pyrene and how is it used?

Benzo(a)pyrene, or BaP, is one of a group of compounds called polycyclic aromatic hydrocarbons (PAHs). They are not produced or used commercially but are very commonly found since they are formed as a result of incomplete combustion of organic materials.

Trade Names and Synonyms:

BaP
3,4-Benz(a)pyrene

Why is Benzo(a)pyrene being Regulated?

In 1974, Congress passed the Safe Drinking Water Act. This law requires EPA to determine safe levels of chemicals in drinking water which do or may cause health problems. These non-enforceable levels, based solely on possible health risks and exposure, are called Maximum Contaminant Level Goals.

The MCLG for benzo(a)pyrene has been set at zero because EPA believes this level of protection would not cause any of the potential health problems described below.

Based on this MCLG, EPA has set an enforceable standard called a Maximum Contaminant Level (MCL). MCLs are set as close to the MCLGs as possible, considering the ability of public water systems to detect and remove contaminants using suitable treatment technologies.

The MCL has been set at 0.2 ppb because EPA believes, given present technology and resources, this is the lowest level to which water systems can reasonably be required to remove this contaminant should it occur in drinking water.

These drinking water standards and the regulations for ensuring these standards are met, are called National Primary Drinking Water Regulations. All public water supplies must abide by these regulations.

What are the Health Effects?

Short-term: EPA has found benzo(a)pyrene to potentially cause the following health effects when people are exposed to it at levels above the MCL for relatively short periods of time: red blood cell damage, leading to anemia; suppressed immune system.

Long-term: Benzo(a)pyrene has the potential to cause the following effects from a lifetime exposure at levels above the MCL: developmental and reproductive effects; cancer.

How much Benzo(a)pyrene is produced and released to the environment?

PAHs are found in exhaust from motor vehicles and other gasoline and diesel engines, emission from coal-, oil-, and wood-burning stoves and furnaces, cigarette smoke; general soot and smoke of industrial, municipal, and domestic origin, and cooked foods, especially charcoal-broiled; in incinerators, coke ovens, and asphalt processing and use.

There are two major sources of PAHs in drinking water: 1) contamination of raw water supplies from natural and man-made sources, and 2) leachate from coal tar and asphalt linings in water storage tanks and distribution lines. PAHs in raw water will tend to adsorb to any particulate matter and be removed by filtration before reaching the tap.

PAHs in tap water will mainly be due to the presence of PAH-containing materials in water storage and distribution systems.

Though few data are available for estimating the potential for PAH release to water from these materials, there are reports that levels can reach 0.01 mg/L with optimum leaching conditions.

What happens to Benzo(a)pyrene when it is released to the environment?

Released benzo(a)pyrene is moderately persistent in the environment. It readily binds to soils and should not leach to ground water, though it has been detected in some ground water. If released to water, it will adsorb very strongly to sediments and particulate matter. In most waters and in sediments it will resist breakdown by microbes or reactive chemicals, but it may evaporate or be degraded by sunlight. Benzo(a)pyrene is expected to bioconcentrate in aquatic organisms that can not metabolize it, including plankton, oysters and some fish.

How will Benzo(a)pyrene be Detected in and Removed from My Drinking Water?

The regulation for BaP became effective in 1994. Between 1993 and 1995, EPA required your water supplier to collect water samples every 3 months for one year and analyze them to find out if BaP is present above 0.02 ppb. If it is present above this level, the system must continue to monitor this contaminant.

If contaminant levels are found to be consistently above the MCL, your water supplier must take steps to reduce the amount of BaP so that it is consistently below that level. The following treatment methods have been approved by EPA for removing BaP: Granular activated charcoal.

How will I know if Benzo(a)pyrene is in my drinking water?

If the levels of BaP exceed the MCL, 0.2 ppb, the system must notify the public via newspapers, radio, TV and other means. Additional actions, such as providing alternative drinking water supplies, may be required to prevent serious risks to public health.

Drinking Water Standards:

Mclg: zero

Mcl: 0.2 ppb

Learn more about your drinking water!

EPA strongly encourages people to learn more about their drinking water, and to support local efforts to protect and upgrade the supply of safe drinking water. Your water bill or telephone book's government listings are a good starting point.

Your local water supplier can give you a list of the chemicals they test for in your water, as well as how your water is treated.

Your state Department of Health/Environment is also a valuable source of information.

For help in locating these agencies or for information on drinking water in general, call: EPA's Safe Drinking Water Hotline: (800) 426-4791.

For additional information on the uses and releases of chemicals in your state, contact the: Community Right-to-Know Hotline: (800) 424-9346