

# BENZENE

## Questions and Answers

**What is benzene?** Benzene is a chemical that is used primarily in the manufacture other chemicals and products. It is a solvent that evaporates at room temperature and is slightly soluble in water. Benzene is produced in smoke as a byproduct of burning materials such as wood and fossil fuels. It is present in gasoline and escapes to the air during common activities such as driving or fueling automobiles.

**How much benzene am I exposed to?** People are most commonly exposed to benzene in the air during activities such as driving in traffic, living in urbanized areas or cigarette smoking. Typical levels (using 2009 data) of benzene measured in North Carolina outdoor air range from 0.000005 to 0.004 mg/m<sup>3</sup>, with a median concentration of 0.00005 mg/m<sup>3</sup>. Indoor benzene levels can be more than an order of magnitude higher than outdoor levels. It has been estimated that smokers are exposed to 10 times more benzene per day than non-smokers. Generally, benzene exposures are higher in areas with more industrial and motor vehicle activity.

**Is benzene dangerous?** At extremely high levels (>2000 mg/m<sup>3</sup>) benzene is capable of causing dizziness, headaches, and a variety of other symptoms. At levels above 3 mg/m<sup>3</sup> benzene exposure has been linked to blood disorders and leukemias in factory workers exposed for many years. These workers were exposed by breathing benzene in air and by absorbing it through their skin. Based on this evidence benzene has been designated a "known human carcinogen."

**How does the DAQ toxics program protect the public from benzene?** The Toxics Program is designed to protect public health by limiting emissions of toxic air pollutants such as benzene from manmade sources. Health protective acceptable ambient level (AAL) guidelines for toxic air pollutants are established using risk assessment methods. Regulated pollution sources are then required to demonstrate that their emissions do not exceed the AAL beyond their property boundaries.

**What is the AAL for benzene?** The AAL for benzene is an annual average value of 0.00012 mg/m<sup>3</sup>. This guideline, established in 1986 and reconfirmed in 1999, is based on benzene's ability to cause cancer and is believed to correspond to a "one in a million" risk level. In theory, if one million people were exposed to this concentration continuously, one person would develop cancer due to that exposure.

**Is the benzene AAL protective for acute (short-term) health effects?** The current AAL for benzene is set more than 25,000 times lower than acute health effect levels. Even under highly unusual circumstances it is virtually impossible to conceive of a situation where acute health effects would be experienced as a result of short-term pollution releases.

**Where can I go if I have more questions about benzene and the toxics program?** For more information please call Lori Cherry, Toxics Protection Branch Supervisor at (919) 733-1476 or Reginald Jordan, Industrial Hygienist at (919) 733-1475.