

Reduced Benzene Levels Since the Introduction of Cleaner-Burning Gasoline

Summary

Since the introduction of cleaner-burning gasoline, there has been a dramatic decrease in the airborne concentrations of benzene, a known human carcinogen. Average benzene concentrations at 11 monitoring stations in Northern California were cut by more than one-half when comparing Spring of 1996 to Spring of 1995. In addition to reducing benzene emissions, cleaner-burning gasoline also reduces smog-forming emissions from motor vehicles by 15 percent. An assessment of the effect of cleaner-burning gasoline on ground-level ozone, a major component of smog, will commence this summer. Although it has only been widely used in California for a few months, the air quality benefits of cleaner-burning gasoline are already being realized.

Background

Despite decades of progress in reducing air pollution, California continues to have the worst air quality in the nation. And even though motor vehicles and other gasoline-powered equipment emit substantially less smog-forming and toxic pollutants today, they are still responsible for about one-half of California's air pollution. That is why the California Air Resources Board (ARB) adopted the program requiring the production and use of cleaner-burning gasoline. The program was developed and implemented over a five year period in close consultation with the oil and automotive industry, environmental organizations, and others.

Cleaner-burning gasoline is any gasoline that meets specifications for eight factors as set by the ARB. Specifically, compared to conventional gasoline, cleaner-burning gasoline has a reduced evaporation potential, reduced aromatic hydrocarbon content (resulting in reduced emission of smog-forming and toxic compounds), lower distillation temperatures (which also reduces smog-forming emissions). It also has oxygenates which enable it to burn more completely. Cleaner-burning gasoline also has 50 percent less benzene, a known human carcinogen, than conventional fuel, resulting in reduced cancer risk from exposure to motor vehicle emissions.

Smog-forming emissions from the use of cleaner-burning gasoline are about 15 percent lower than traditional, higher-polluting fuels. The reduced pollution is equivalent to removing 3.5 million vehicles from California's roads. It will also reduce human cancer risk from exposure to toxics in vehicle emissions by 30 to 40 percent.

Though cleaner-burning gasoline was not required to be at the pumps in California until June 1, 1996, it became available well ahead of schedule. As a result, by late March, cleaner-burning gasoline had largely replaced previous gasolines throughout the State.

Benzene - A Known Human Carcinogen

Benzene is one of the hydrocarbons present in crude oil, gasoline and other petroleum products. Benzene is a known human carcinogen with leukemia being the type of cancer most commonly associated with

exposure. About 90 percent of airborne benzene results from gasoline usage. It enters the air through tailpipe emissions and through evaporation, such as during vehicle refueling.

Benzene Monitoring Results

The average benzene concentrations at 11 monitoring stations in Northern California were more than 50 percent less in Spring of 1996 when compared to Spring of 1995. While factors such as weather and the time of year affect benzene concentrations, the sharp 1996 drop is primarily due to cleaner-burning gasoline, which contains about half as much benzene as conventional gasoline. The 11 Northern California monitoring stations are located in Bakersfield, Chico, Concord, Fremont, Fresno, Modesto, Richmond, Roseville, San Francisco, San Jose, and Stockton. Benzene levels in Southern California declined sharply in 1995 following the introduction of federal reformulated gasoline, which has the same low benzene content as California's cleaner-burning gasoline. Southern California switched to the State's cleaner-burning gasoline at the same time as Northern California. Benzene concentrations at nine Southern California monitoring stations in Spring of 1996 averaged more than 50 percent less than in Spring of 1994, the last year that conventional gasoline was used in the region.

The ARB will continue to monitor air quality to assess the effectiveness of cleaner-burning gasoline. Average benzene concentrations are determined quarterly at each of 20 monitoring stations. An assessment of the effect of the fuel on ground-level ozone, the major component of smog, will commence this summer, when ozone levels reach their peaks.