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Styrene Information and Research Center Statement on the Cal/EPA's Public Health Goal for Styrene in Drinking Water

California's own test data on some 15,000 water wells indicated that styrene is undetectable in state drinking water. And the current styrene science points away from any human cancer concern for styrene. Given these facts, the Styrene Information and Research Center (SIRC) believes that the California Environmental Protection Agency (Cal/EPA) wasted time and scarce resources in setting a Public Health Goal (PHG) for styrene in drinking water.

In short, the scientific basis that Cal/EPA has used to set the onerous 0.5 parts per billion (ppb) styrene PHG -- lung tumor formation in styrene-exposed mice -- is neither appropriate, nor scientifically supportable. Moreover, the styrene PHG will not enhance public health, but could unnecessarily alarm California consumers.

Styrene inhalation studies conducted during the 1990s found lung tumors in exposed mice, but no tumors in rats even though the rats were exposed to much higher levels. Meanwhile, the results of extensive peer-reviewed studies of workers in styrene-related industries, including a major study[1] published in late 2009, collectively show that exposure to styrene does not increase the risk of cancer[2]. The European Union concluded recently that "based on human studies, there is no clear and consistent evidence for a causal link between specific cancer mortality and exposure to styrene."

Over the years since the mouse lung tumors were found, the styrene industry has commissioned significant additional research to better define styrene's tumorogenic process – its mode of action[3] (MoA) – in the mouse, and examine why styrene does not seem to produce the

[1] "Epidemiologic Studies of Styrene and Cancer: A Review of the Literature," American College of Occupational and Environmental Medicine's *Journal of Occupational and Environmental Medicine*, reported that the "available epidemiologic evidence does not support a causal relationship between styrene exposure and any type of human cancer."

[2] A general statement concerning styrene's carcinogenic potential is available in the "Newsroom" at www.styrene.org or by request to Joe Walker, walkercom2@aol.com.

[3] Mode of action refers to the way a substance acts biologically within and upon an organism. Susceptibility to a chemical's toxic effects in different species is determined by the interaction of differences in genetic makeup, which can lead to structural, metabolic and other differences.

same response in rats or humans. Based on this exhaustive research, it is SIRC's position that the finding of lung tumors in mice exposed to styrene is not relevant for human risk assessment[4].

An absence of cancer findings in humans exposed at exponentially higher styrene levels than any possible drinking water concentration would seem to confirm that carcinogenicity is not a relevant endpoint for setting a styrene PHG. Despite this evidence and SIRC's continual urging that Cal/EPA use the latest MoA science when evaluating styrene's potential health effects, the agency has chosen to disregard the data and set a scientifically unsupportable PHG for styrene.

Concerning OEHHA's reference to "genotoxic effects," there is little overall scientific evidence that styrene acts via a genotoxic MoA. Standard tests for mutagenicity of styrene are negative and animal studies show styrene does not affect chromosomes at exposures up to 500 parts per million. Some worker studies report genotoxic effects, while others do not; it is unclear in those studies the levels of styrene to which workers were exposed or what genotoxic exposures they may have had at work or home.

According to Cal/EPA, PHG documents are used to provide technical assistance to the California Department of Public Health and also are reference materials for federal, state and local public health officials and the public.

Arlington, Va.-based SIRC is the scientific research center for the North American styrene industry. Since its founding in 1988, SIRC has commissioned $20-plus million worth of scientific research to understand styrene's potential environmental health effects. Styrene is a major industrial chemical that is used to make thousands of familiar products that are essential to modern-day life[5].

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Please direct questions to SIRC's communications representative, Joseph Walker, Walker Communications, Walkercom2@aol.com or 703-491-3301.

[4] A briefing paper on "Styrene's Mode of Action" is available in the "Newsroom" at www.styrene.org or upon request to Joe Walker, walkercom2@aol.com.
[5] Information on products made from styrene may be found at www.styrene.org and www.styreneforum.org.