Ozone and Bottled Water:

New Developments

on Allowable Bromate Levels

in Drinking Water

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Summary: *As part of its ruling on disinfection by-products, the USEPA last fall towered the bar for the organic ion bromide, which under conditions of ozonation can produce bromate, which has been identified as a health hazard. This ruling will affect water bottlers and dealers alike utilizing the technology. Here is a discussion of the issue.*

The importance of professional association membership is once again being demonstrated as the U.S. Environmental Protection Agency (USEPA) announces changes in the *Federal Register* (November 1998) regarding the maximum allowable contaminant levels (MCL) of disinfection by-products (DBP) in drinking water. As a general trade group involved in the presentation of potable water for the purpose of human consumption, we need to be aware of these changes and develop proper responses.

THMs reduction

Trihalomethanes (THMs), a byproduct of chlorination and the presence of certain organics in water, have been regulated at an MCL of 100 micrograms per liter (ug/L), or parts per billion (ppb), since 1978 by the USEPA. There has been no other regulation concerning DBPs—until now.

Additional changes made in the November announcement concern reductions from the 1978 THMs levels. The former 100 ug/L limit,concerning four compounds (chloroform, chlorodibromomethane, bromodichloromethane and bromoform) that are suspected carcinogens, has been lowered. The newer levels approved are 80 ug/L.

HAAs

Additionally, the haloacetic acids (HAAs) were further reduced to 60 ug/L. These DBPs are chlorination by-products that occur as a result of the use of chlorine as a disinfectant. These changes are causing the municipal drinking water industry to consider alternative disinfection methods.

Bromide to bromate

The real eye opener resulting from the November USEPA new MCLs list is in the regulation of bromate ions. Bromate ion concern is coming to the forefront as a result of research conducted by the USEPA concluding the possibility of hazards within all potable water, including bottled drinking water. The new MCL proposed for bromate ion presence is 10 ug/L, or ppb.

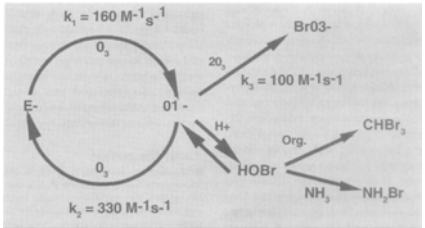

Figure 1.
Reactions of ozone with bromide and hypobromite ions in aqueous media.
Source: Haag, W.R., and J. Hoigné, "Kinetics and Products of the Reaction of Ozone with Various Forms of Chlorine and Bromine in Water," Ozone: Science and Engineering, 1984, 6 (2): 103-114.