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## FREQUENTLY ASKED QUESTIONS ABOUT CHLORAMINE

### **What is chloramine?**

Chloramine is a yellow to colorless liquid with a strong odor. Chloramine is a combination of chlorine and ammonia, and is used as a disinfectant in water supplies. Chloramine exists as three different forms or species: monochloramine (NH<sub>2</sub>Cl), dichloramine (NHCl<sub>2</sub>) and trichloramine (NCl<sub>3</sub>). These forms are chemically related and are easily converted into each other; thus, they are more appropriately called chloramines. Chloramines are weaker disinfectants than chlorine, but are more stable, thus extending disinfectant benefits throughout a water utility's distribution system. Chloramine residual is long lasting than free chlorine; it provides better protection against bacterial re-growth in systems with large storage tanks and dead-end water mains.

### **Why disinfect drinking water?**

All drinking water suppliers using surface water are required by the U.S. Environmental Protection Agency (EPA) to use disinfectants to eliminate disease-causing organisms in drinking water supplies. Disinfection of drinking water has benefited public health enormously by lowering the rates of infectious diseases (i.e. typhoid, hepatitis, and cholera) spread through untreated water. Utilities must also maintain a residual disinfectant throughout the drinking water distribution system to assure there is no bacterial growth once the water has left the treatment plant.

### **What are the byproducts of chloramination?**

Chloramines do not tend to react with organic compounds; many systems will experience fewer incidences of taste and odor complaints when using chloramine and the formation of harmful byproducts like trihalomethanes.

### **What are the health effects of chloramines?**

Chloramines can become toxic when present in a high concentration in water. Some people who use water containing chloramine well in excess of 4.0 mg/L may experience irritation to their eyes and nose. Chloramine can contribute to respiratory problems, sinus congestion, sneezing, coughing, choking, severe skin reactions, and can damage digestive mucous at high concentrations. Chloraminated water that meets EPA's standard is safe to use for drinking, bathing, cleaning laundry, and other household activities.

### **Are there any special considerations for using chloramine to disinfect public water supplies?**

Yes, people on kidney dialysis may be affected. During dialysis, water comes in contact with the blood and must be pretreated to remove the chlorine and ammonia. Medical treatment centers that perform dialysis are responsible for purifying the water that enters dialysis machines. If chloraminated water is not filtered, some dialysis patients can develop a type anemia where the blood cannot carry enough oxygen to the body's cells.

People with home dialysis machines should check with their physicians or equipment supplier to determine the proper filtration adjustment to be made prior to chlorinated water usage. Rubber components are susceptible to damage from exposure to chloraminated water. Fresh and salt water fish in aquaria are sensitive to chlorine and chloramine in water. Special care should be used to neutralize the water prior to exposure.

### **What is the drinking water standard for chloramines?**

EPA sets the standards for public drinking water, known as Maximum Contaminant Levels or MCLs. EPA's MCL and Maximum Residual Disinfectant Levels (MRDL) for chloramines in drinking water is 4 mg/l. A Reference Dose (RFD) for adults is 1 mg/kg/day.

### **Where can my physician or I get more information?**

If you need further information regarding the health effects of chloramine, please contact the Virginia Department of Health, Division of Environmental Epidemiology, 109 Governor Street, 4th Floor, Richmond, VA 23219, or call (804) 864-8182.

**Prepared by:** Virginia Department of Health  
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