

## 1-Chlorination

The disinfectant of choice has been chlorine. In general, chlorination is effective, relatively inexpensive, and provides effective levels of disinfectant residual for safe distribution. Applied as a gas (elemental chlorine,  $\text{Cl}_2$ ), liquid (sodium hypochlorite), or solid (calcium hypochlorite), each of these forms has advantages and disadvantages. The most cost-effective and efficient is gaseous chlorine. Large treatment works commonly use this method. Gaseous chlorination is also the most dangerous method--chlorine gas is lethal at concentrations as low as 0.1% air by volume. In non-lethal concentrations, it irritates the eyes, nasal membranes, and the respiratory tract. Because of the hard safety requirements, and because it is easier to use and less toxic than gaseous chlorine, sodium hypochlorite is the most common disinfectant in smaller systems. Chlorine works to help oxidize inorganics, and stop the biological action that occurs in the accumulations on the bottom of clarifiers, preventing dangerous gaseous buildups. Chlorination prior to filtration keeps algae from growing and bacterial populations from developing in and on the filter itself.

## 2- Sodium hypochlorite

Provides 5 to 15% available chlorine. Sodium hypochlorite must be stored with care, and its must be kept isolated from vulnerable machinery. Sodium hypochlorite solution provides lower levels of protection against pathogens than chlorine gas. Because of regulatory pressures, some large water treatment facilities are converting to sodium hypochlorite disinfection.