

Water Quality : Chloramines and Aquariums

SA Water disinfects water supplies for drinking water to protect public health. As a result, residual levels of chemical substances used for disinfection suitable for drinking may be unsuitable for aquariums or ponds with aquatic fauna.

The two most common methods of disinfection are:

- chlorination (using chlorine)
- chloramination (using chloramines)

Chloramination is used in a number of our supply systems because it is more persistent compared to chlorine. Chloramines are formed from a combination of ammonia and chlorine. These are very toxic to fish at levels as low as 0.1 milligrams per litre (equivalent to 0.1 parts per million) and must be removed from tap water before being used in fish aquariums or ponds. Some free ammonia may also be present in chloraminated water and ammonia can be toxic to fish although it is normally present in fish aquariums as a natural waste product.

Removing chloramines

While chlorine can be removed in several hours by exposure to sunlight, it may take weeks for chloramines to completely break down. Chloramines are generally removed by a de-chlorinating agent (usually sodium thiosulphate). This is commonly found in aquarium water conditioning agents or by filtration through high quality granular activated carbon. De-chlorinating agents can be used to remove chlorine or chloramines. However, for chloramines particular care should be given to the following:

- When using a commercial aquarium water conditioning agent, two to three times the recommended dosage may be required to remove the relatively high levels of chloramines in treated water.
- You may prefer to use pure sodium thiosulphate as most de-chlorinating agents contain other additives for slime protection and water ageing which may be harmful in higher dosages. If pure sodium thiosulphate is used, the recommended dosage is 10 milligrams per litre for every 1 milligram of chloramines (or chlorine) per litre. For example, if a test kit measures 3 milligrams per litre of chloramine in the tap water, then 30 milligrams of sodium thiosulphate will be required for every litre of water.
- De-chlorinating agents remove chlorine leaving ammonia and this must be removed or controlled (see overleaf for more detail)



High quality granular activated carbon removes chloramines well but its useful life depends on the size and type of carbon used and conditions such as pH, flow rate and contact time. As with the de-chlorinating agent, careful monitoring using a test kit is necessary to ensure satisfactory results. The use of activated carbon may be particularly suitable for outdoor ponds where tap water is added continuously.

Removal and control of ammonia

Some ammonia will be present in chloraminated tap water. Ammonia is also produced when fresh granular activated carbon is used and as a result of removing chloramines with a de-chlorinating agent. Ammonia can be removed or controlled by the following methods:

- *Nitrifying bacteria* In a well-functioning (pH neutral) tank, nitrifying bacteria removes the ammonia produced from fish waste and from the breakdown of protein in uneaten fish food. These bacteria grow on solid surfaces such as gravel, sand or filter material. This method is not suitable for new aquariums as it could take up to six weeks for the bacteria to function properly.
- *pH control* Keeping the pH to 7.5 or lower can control the toxic effects of ammonia. Careful monitoring is necessary and pH test kits and correction chemicals are available from aquarium retailers. It's important to note this method is unsuitable for certain aquarium fish such as marine species which require a high pH.
- *Ammonia removal resins* Placing ammonia removal resins inside a box or canister filters in a tank can reduce ammonia levels significantly. However, two to three times the recommended dosage may be required to remove the relatively high levels of ammonia that could be encountered with chloraminated water. This method is not suitable for salt water.

Important things to consider

- The chloraminated tap water must be neutralized before its use in fish aquariums.
- It is good practice to make smaller more frequent water changes to minimise the risks involved when using tap water containing chloramines.
- Manufacturer's recommended dosages of aquarium conditioning agents and ammonia removal resins may be inadequate for eliminating chloramines and ammonia respectively from South Australian potable water.
- Treatments which are NOT effective include boiling the water, letting it stand outside for a day or two, using chemicals that remove only chlorine and putting water through a reverse-osmosis filter.

More information

Further enquiries should be directed to your local pet shop or aquarium retailer or contact the SA Water Customer Service Centre on 1300 650 950. This fact sheet has been prepared to give a broad outline of the information relating to the disinfection of tap water that may be used for ponds and aquariums. You should not rely on it without obtaining specific advice to your own requirements. Remember to check water restrictions or permanent water conservation measures for fountains, ponds and water features in your local area.