



Chemical Quality: Sulphate (SO₄)

What is Sulphate?

- 💧 Magnesium sulphate is better known as the purgative, “Epsom salts”.
- 💧 Sulphate is the oxi-anion of sulphur.

Sulphate in water

- 💧 If the sulphate concentration in a water source is less than 10 mg/l, it is an indication that the water source is fresh and unpolluted.
- 💧 Higher levels of sulphate in any water source can be indicative of some form of pollution.
- 💧 Typical pollution sources are mine drainage and effluent return flows, which can contain sulphate concentrations of as high as 500 mg/l.

What problems can Sulphate cause?

- 💧 When new water users (new residents or travellers) are initially exposed to higher levels of sulphate in drinking water, it can have adverse health effects, causing diarrhoea. Adaptation after prolonged exposure can take place.
- 💧 Aesthetically elevated sulphate levels in water can impart a bitter, astringent taste and a “rotten egg” smell to water.
- 💧 High sulphate concentrations in water can accelerate corrosion of metals, especially iron.
- 💧 Children under the age of 2 years, water users or travellers and people who drink large volumes of water can be at risk and suffer from adverse health effects, such as “Traveller’s diarrhoea”.

How can Sulphate in water be treated?

- 💧 Sulphate removal from water can be done by means of the following processes:
 - Ion exchange with a resin.
 - **Precipitation** with salts of calcium, followed by **settlement** and **filtration**.
 - Desalination processes, such as **ion-exchange demineralisation, reverse osmosis or distillation**.
- 💧 All of the above treatment processes require a high level of operator and maintenance skills.
- 💧 Home treatment kits, using ion-exchange processes are expensive and treat only small volumes of water.



sulphur
16
S
32.065



Reference: DWAF (1998). Quality of domestic water supplies. Vol. 1: Assessment Guide. WRC No. TT 101/98, pp. 21.