
Sulfate

For water, seawater and oil-field water

Turbidimetric Method

Introduction

Sulfate occurs in natural waters in a wide range of concentrations. Mine waters and industrial effluents frequently contain large amounts of sulfate from pyrite oxidation and the use of sulfuric acid.

Because of sulfate's cathartic action, a secondary maximum contaminant level has been established by the USEPA, in accordance with the Safe Drinking Water Act. The taste threshold of magnesium sulfate is 400 to 600 mg/L; calcium sulfate is 250 to 800 mg/L. Sulfate may be either beneficial or detrimental in water used for manufacturing and domestic supply. The presence of sulfate is advantageous in producing desired flavors in the brewing industry. In domestic water systems, sulfates do not appear to cause any increased corrosion on brass fittings, but concentrations above 200 mg/L do increase the amount of lead dissolved from lead pipes.

Sulfate determination is important in oil field applications where two or more waters are mixed. High concentrations of sulfate, along with barium, calcium, and strontium, can form insoluble scales.

The procedure for determining sulfate is a modification of the Barium Sulfate Turbidimetric Method. A single dry powder reagent, SulfaVer™4 Sulfate Reagent, will cause a milky precipitate to form if sulfate is present. The amount of turbidity formed is proportional to the amount of sulfate present.

Chemical reactions

Sulfate is determined by its quantitative precipitation with barium chloride. Because the finely divided barium sulfate turbidity formed is proportional to the amount of sulfate in the sample, a photometric reading enables the sulfate concentration to be accurately determined.

