

Determination of Sulphate by Nephelo turbid metric Method

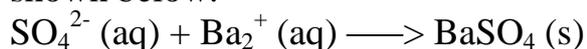
AIM- The aim of the experiment is to determine sulphate in given sample by using turbid metric method.

BACKGROUND-

Sulphates are found in appreciable quantity in all natural waters, particularly high in arid and semi arid regions where natural waters in general have high salt content. Sulphate salts are mostly soluble in water and impart hardness. Water with high concentrations has a bitter test. Sulphate may cause intestinal disorders.

A group of environmental scientists are doing research on the effects of mining on human water supplies and the efficiency of several water treatment techniques.

When testing the water it should be kept in mind that an acceptable concentration for drinking water is 250 ppm OD sulphate. Although sulphate is not particularly toxic if the concentration is high then it may cause other problems, such as build up in high-pressure boilers, the taste of the water being bitter, and at concentrations above 1000 ppm, the water may cause diarrhoea. The turbid metric method for the determination of sulphate concentration is based on the fact that light is scattered by particulate matter in aqueous solution. When barium and sulphate react in water, they make the solution turbid, which means the concentration of the Sulphate can be measured by using a spectrophotometer. The equation for the reaction of barium and sulphate is shown below.



REQUIREMENTS-

Chemicals: Concentrated HCl

Glycerol

Isopropyl alcohol

NaCl

Apparatus: Beakers

Flasks

PROCEDURE-

First a conditioning reagent was prepared by mixing 50 ml glycerol with a solution containing 30 ml concentrated HCl, 300ml distilled water, 100 ml isopropyl alcohol, and 75 g NaCl. Then, using a stock solution of 1000 ppm sulphate, create four 100 ml standards with the concentrations of 10.0 ppm, 20.0 ppm, 40.0 ppm, and 80.0 ppm.

For each of the standards the following procedure was used:

(I) Ten ml of standard and 10ml of distilled water added to a 250 ml Erlenmeyer flask. Then added with 5.0 ml of the conditioning reagent and stirred gently.

(II) Measured about 0.1-0.2 g of 20-30 mesh BaCl and added to the flask. Stirr the contents of the flask for one minute. After the completion of the stir time, quickly and carefully poured the contents into a spectrophotometer cell, and let stand for five minutes. While waiting, the spectrophotometer was auto zero at 420 nm with distilled water and then taken the absorbance of the standard.

(III) After taking the absorbance for the remaining three standards an absorbance vs. concentration curve was created, using the original concentrations of the standards. To find the concentration of sulfate in the samples, the same procedure was used for the standards.

CONCLUSION-

The value of sample in standard curve was intrapolated and the exact amount with percentage purity was calculated.

The amount of sulfate in the sample was found to be..... mg.

REFERENCES-

1. AWWA, WEF, APHA, Standard Methods for the Examination of Water and Wastewater. 1998.
2. Sawyer CN, McCarty PL, Parkin GF. Chemistry for Environmental Engineering. Fourth Edition, McGraw-Hill, Inc., New York. 2000.