

Test kit for the determination of sulfite, hydrogen sulfite and sulfurous acid

Methode:

Titrimetric determination after addition of iodine solution and reverse titration of unused iodine with sodium thiosulfate

Contents of test kit (*refill pack):

sufficient for 100 tests with a sulfite concentration up to 100 mg/L SO_3^{2-}

100 mL Sulfite-1*	1 test tube with ring mark
30 mL Sulfite-2*	1 dosage syringe 1 mL
10 mL Sulfite-3*	1 titration syringe 0–100 mg/L SO_3^{2-}
100 mL Sulfite TL SU 100*	(1 graduation mark \triangleq 2 mg/L)
	2 dropping tips for the dosage syringe
	2 dropping tips for the titration syringe

Hazard warning:

Sulfite-2 contains sulfuric acid 51–80%.

H314 Causes severe skin burns and eye damage.

P260, P280, P301+330+331, P303+361+353, P304+340, P305+351+338 Do not breathe vapors. Wear protective gloves/eye protection. IF SWALLOWED: rinse mouth. Do NOT induce vomiting. IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower. IF INHALED: Remove to fresh air and keep at rest in a position comfortable for breathing. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. For further information ask for a safety data sheet.

Procedure:

1. Rinse the test tube several times with the water to be tested, then fill up to ring mark.
2. Place a dropping tip on the dosage syringe. Press down the plunger, dip the tip into reagent **Sulfite-1** and slowly draw back the plunger, until the lower edge of the black plunger seal is level with value 1.0 mL on the scale. The small air cushion under the plunger has no effect. Add the content of the syringe (1.0 mL) to the sample and mix.
3. Add **2 drops of Sulfite-2** and mix. The solution turns **yellow**. (If the solution remains colorless, continue according to point 7.)
4. Add **1 drop of Sulfite-3**. The solution turns **greyish to yellowish blue**.
5. Place a dropping tip on the titration syringe. Press down the plunger, dip the tip into the titration solution **TL SU 100** and slowly draw back the plunger, until the lower edge of the black plunger seal is level with value 100 on the syringe scale. The small air cushion under the plunger will not effect the determination.
6. **Adding the titration solution:** We recommend holding the syringe in the left hand and the test tube in the right (see sketch) and then add the titration solution drop by drop,

lightly swirling the test tube at the same time. Continue to slowly add the titration solution until the test solution is completely **colorless**. Read off sulfite content in mg/L SO_3^{2-} from the syringe barrel (lower rim of the black plunger O-ring). The final change to colorless can be well followed against a white background (e.g. a piece of white paper). The titration should not be carried out too slowly. After the end of the titration, another color change back to blue should be ignored.

7. Should the test solution not change color to yellow, after the addition of two drops of Sulfite-2 then the sulfite concentration is higher than 100 mg/L SO_3^{2-} . In this case repeat the test and add **2 mL of Sulfite-1**, instead of just 1 mL (range: 100–200 mg/L SO_3^{2-}). In the case of even higher sulfite concentrations add correspondingly larger amounts of Sulfite-1 from the beginning, until the addition of Sulfite-2 changes the color to yellow. Titrate until color change (see above) and read off sulfite content in mg/L SO_3^{2-} from the syringe barrel. For each **additional** mL of Sulfite-1 add 100 mg/L sulfite to the test results.

This method can be applied also for the analysis of sea water.

Disposing of the samples:

The used analysis specimens can be flushed down the drain with tap water and channelled off to the local sewage treatment works.

Interferences:

Larger concentrations of sulfide and nitrite ions as well as ascorbic acid interfere:

1 mg/L NO_2^-	\triangleq 1,7 mg/L SO_3^{2-}
1 mg/L S^{2-}	\triangleq 2,5 mg/L SO_3^{2-}
1 mg/L ascorbic acid	\triangleq 0,5 mg/L SO_3^{2-}

Note:

For the determination of dithionite contact MACHEREY-NAGEL for special working instructions.

1 mg/L SO_3^{2-}	\triangleq 0.80 mg/L SO_2	\triangleq 0.40 mg/L S
100 mg/L SO_3^{2-}	\triangleq 1.25 mmol/L SO_3^{2-}	

