

Supelco®

1.11148.0001

MQuant® Sulfite Test

SO₃²⁻

1. Method

Titrimetric determination with titration pipette

In sulfuric solution by titration with potassium iodate solution against starch as the indicator, iodide ions are oxidized to iodine, which in turn oxidizes sulfite ions to sulfate ions. At the titration end-point, excess iodine forms a blue complex with the indicator. The sulfite concentration is determined from the consumption of titration solution (iodometric determination).

2. Measuring range and number of determinations

Measuring range ^{1, 2)}	Graduation of the titration pipette	Number of determinations ³⁾
0.5 - 50 mg/l Na ₂ SO ₃	0.5 mg/l Na ₂ SO ₃	200 at 40 mg/l Na ₂ SO ₃
0.32 - 32 mg/l SO ₃ ²⁻	0.32 mg/l SO ₃ ²⁻	at 25 mg/l SO ₃ ²⁻

¹⁾ with 1 full pipette

²⁾ for conversion factors see section 8

³⁾ In the case of sodium sulfite contents of more than 40 mg/l, the maximum number of determinations possible is fewer than 200 (see section 10).

3. Applications

Sample material:

Groundwater, drinking water, and surface water
Wastewater
Boiler water
Boiler feed water
Water in heating systems
Food and beverages, milk and dairy products
This test is **not suited** for seawater.

4. Influence of foreign substances

Reducing substances such as e.g. hydrazine, oximes, nitrites, and sulfides interfere with the determination.

5. Reagents and auxiliaries

Please note the warnings on the packaging materials!

The test reagents are stable up to the date stated on the pack when stored closed at +15 to +25 °C.

Package contents:

1 bottle of reagent SO₃-1
1 bottle of reagent SO₃-2 (indicator solution)
2 bottles of reagent SO₃-3 (titration solution)
1 graduated 5-ml plastic syringe
1 test vessel
1 titration pipette
1 card with brief instruction

Other reagents:

MQuant® Sulfite Test, Cat. No. 110013,
MQuant® range 10 - 400 mg/l SO₃²⁻
MColorpHast™ Universal indicator strips pH 0 - 14, Cat. No. 109535
Sodium hydroxide solution 1 mol/l Titripur®, Cat. No. 109137
Sulfuric acid 0.5 mol/l Titripur®, Cat. No. 109072
Sodium sulfite anhydrous for analysis EMSURE®, Cat. No. 106657
Titriplex® III GR for analysis, Cat. No. 108418

6. Preparation

- The pH must be within the range 2 - 12. Adjust, if necessary, with sodium hydroxide solution or sulfuric acid.
- Check the sulfite content with the MQuant® Sulfite Test. Dilute the sample, if necessary, with distilled water.

7. Procedure

Rinse the test vessel several times with the pretreated sample.

Pretreated sample (15 - 25 °C)	5 ml	Inject into the test vessel with the syringe.
Reagent SO ₃ -1	2 drops ¹⁾	Add and swirl.
Reagent SO ₃ -2	2 drops ¹⁾	Add and swirl.

Place the titration pipette **loosely** on the open reagent bottle SO₃-3. **Slowly** withdraw the piston of the titration pipette from the lowest position until the **lower** edge of the black piston seal is level with the zero mark of the scale. (This fills **only the dropping tube** with titration solution.)

Remove the titration pipette and briefly wipe the tip of the dropping tube. Then **slowly** add the titration solution dropwise to the sample **while swirling** until its color changes to **blue**. Shortly before the color changes, wait a few seconds after adding each drop.

Read off the result in mg/l (Na₂SO₃) from the scale of the titration pipette at the **lower** edge of the black piston seal.

¹⁾ Hold the bottle vertically while adding the reagent!

Notes on the measurement:

- While filling the titration pipette, it must **not** be screwed tightly on the reagent bottle!
- After the analysis inject any titration solution still remaining in the pipette back into the reagent bottle SO₃-3 and **close the reagent bottle tightly using the pipette instead of the screw cap**.
- Concerning the result of the analysis, the dilution (see section 6) must be taken into account:

$$\text{Result of analysis} = \text{measurement value} \times \text{dilution factor}$$

8. Conversions

Units required	=	units given	x	conversion factor
mg/l SO ₃ ²⁻		mg/l Na ₂ SO ₃		0.635
mg/l Na ₂ SO ₃		mg/l SO ₃ ²⁻		1.574

9. Method control

To check test reagents, measurement device, and handling: Dissolve 1.0 g of anhydrous sodium sulfite and 0.1 g of Titriplex® III in distilled water, make up to 1000 ml with distilled water, and mix. Na₂SO₃ content: 1000 mg/l. Dilute this standard solution with distilled water to 25 mg/l Na₂SO₃ (15.9 mg/l SO₃²⁻) and analyze **immediately** as described in section 7. Additional notes see under www.qa-test-kits.com.

10. Notes

- Reclose the reagent bottles immediately after use.
- Store the reagent bottle SO₃-3 (titration solution) **with the titration pipette firmly attached** lying flat in the corresponding depression in the pack.
- Rinse the test vessel and the syringe **with water only**.
- In titrimetric determinations the consumption of titration solution is dependent on the concentration of the substance to be determined. The quantities of indicator and titration solution contained in the reagent bottles have been calculated to suffice for 200 determinations each of 40 mg/l Na₂SO₃. The following applies for other sodium sulfite contents:

Sodium sulfite content mg/l	Number of determinations	Indicator solution	Titration solution
0.5 - 40	200	is used up completely	A remainder is left over.
>40	<200	A remainder is left over.	is not sufficient for 200 determinations

- Information on disposal can be obtained at www.disposal-test-kits.com.

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