

Scope and Application: For testing total sulfides, H₂S, HS⁻, and certain metal sulfides in groundwater, wastewater brines, and seawater; USEPA Approved for reporting wastewater analysis**

* Adapted from *Standard Methods for the Examination of Water and Wastewater*.

** Procedure is equivalent to USEPA method 376.2 and Standard Method 4500-S²⁻- D for wastewater.

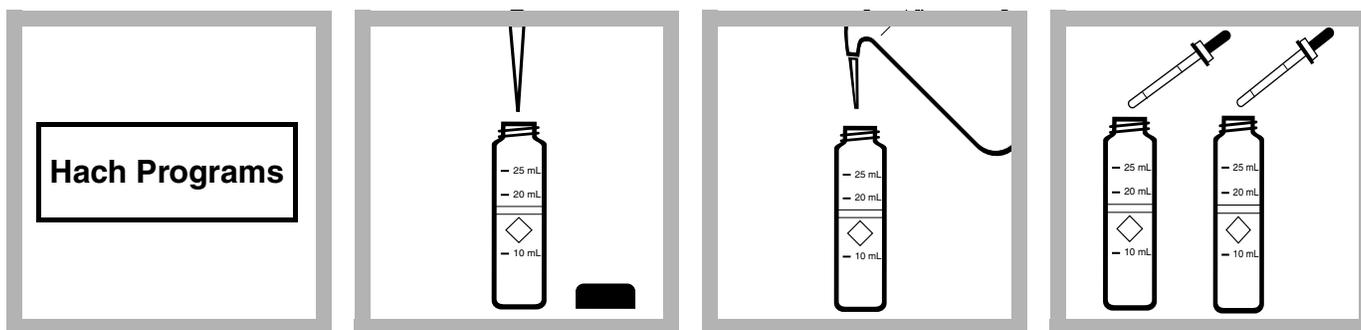


Tips and Techniques

- Analyze samples immediately. Do not preserve for later analysis.
- Avoid excessive agitation of samples to minimize sulfide loss.
- Some sulfide loss may occur if dilution is necessary.
- Wipe the outside of sample cells before each insertion into the instrument cell holder. Use a damp towel followed by a dry one to remove fingerprints or other marks.
- Sulfide 2 reagent contains potassium dichromate. The final solution will contain hexavalent chromium (D007) at a concentration regulated as a hazardous waste by Federal RCRA. Please see *Section 4* for further information on proper disposal of these materials.



Method 8131



1. Touch
Hach Programs.

Select program

690 Sulfide.

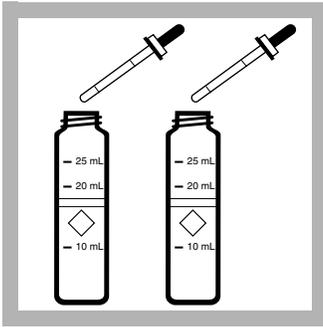
Touch **OK.**

2. Avoiding excess
agitation of the sample,
use a pipet to add 25 mL
of sample to a sample cell
(the prepared sample.)

3. Measure 25 mL of
deionized water into a
second sample cell
(the blank).

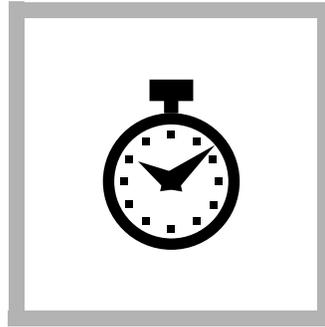
4. Using the calibrated
1-mL dropper, add
1.0 mL of Sulfide 1
Reagent to each cell.
Swirl to mix.

Sulfide

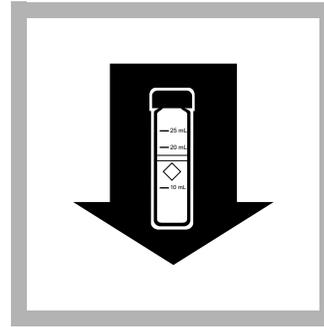


5. Using the calibrated 1-mL dropper, add 1.0 mL of Sulfide 2 Reagent to each cell. Cap the cell and immediately swirl to mix.

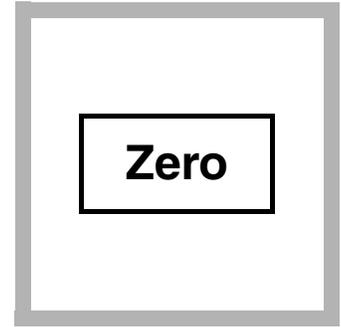
A pink color will develop, then the solution will turn blue if sulfide is present.



6. Touch the timer icon. Touch **OK**. A five-minute reaction period will begin.



7. When the timer beeps, wipe the blank and place it into the cell holder.



8. Touch **Zero**. The display will show:
0 $\mu\text{g/L S}^{2-}$



9. Wipe the prepared sample and place it into the cell holder. Read the results.

Note: See the Instrument Manual for more information on taking a reading.

Determining Soluble Sulfides

Determine soluble sulfides by centrifuging the sample in completely filled, capped tubes and analyzing the supernatant. Insoluble sulfides are then estimated by subtracting the soluble sulfide concentration from the total sulfide result.

Interferences

Interfering Substance	Interference Levels and Treatments
Strong reducing substances (sulfite, thiosulfate and hydrosulfite)	Interfere by reducing the blue color or preventing its development
Sulfide, high levels	High concentrations of sulfide may inhibit full color development and require sample dilution. Some sulfide loss may occur when the sample is diluted.
Turbidity	For turbid samples, prepare a sulfide-free blank as follows. Use it in place of the deionized water blank in the procedure. <ol style="list-style-type: none"> 1. Measure 25 mL of sample into a 50-mL Erlenmeyer flask. 2. Add Bromine Water (Cat. No. 2211-20) dropwise with constant swirling until a permanent yellow color just appears. 3. Add Phenol Solution (Cat. No. 2112-20) dropwise until the yellow color just disappears. Use this solution in step 3 in place of deionized water.

Sample Collection, Storage and Preservation

Collect samples in clean plastic or glass bottles. Fill completely and cap tightly. Avoid excessive agitation or prolonged exposure to air. Analyze samples immediately.

Method Performance

Precision

Standard: 275 µg/L S²⁻

Program	95% Confidence Limits of Distribution
690	256–294 µg/L S ²⁻

See *Section 3.4.3 Precision* for more information, or if the standard concentration did not fall within the specified range.

Sensitivity

Portion of Curve	ΔAbs	ΔConcentration
Entire range	0.010	5 µg/L S ²⁻

See *Section 3.4.5 Sensitivity* for more information.

Summary of Method

Hydrogen sulfide and acid-soluble metal sulfides react with N,N-dimethyl-p-phenylenediamine sulfate to form methylene blue. The intensity of the blue color is proportional to the sulfide concentration. High sulfide levels in oil field waters may be determined after proper dilution. Test results are measured at 665 nm.

Sulfide

Required Reagents

Description	Quantity required per test	Unit	Cat. No.
Sulfide Reagent Set (100 tests)			22445-00
Includes:			
(2) Sulfide 1 Reagent	2 mL	100 mL MDB.....	1816-32
(2) Sulfide 2 Reagent	2 mL	100 mL MDB.....	1817-32
Water, deionized	25 mL	4 liters	272-56

Required Apparatus

Pipet, volumetric, Class A, 25 mL	1	each	14515-40
Pipet Filler, safety bulb	1	each	14651-00
Sample Cells, 10-20-25 mL, w/cap.....	2	6/pkg.....	24019-06



FOR TECHNICAL ASSISTANCE, PRICE INFORMATION AND ORDERING:
In the U.S.A. – Call toll-free 800-227-4224
Outside the U.S.A. – Contact the HACH office or distributor serving you.
On the Worldwide Web – www.hach.com; E-mail – techhelp@hach.com

HACH COMPANY
WORLD HEADQUARTERS
Telephone: (970) 669-3050
FAX: (970) 669-2932