

WARNING: Hydrogen and arsine gases are generated during the test. Work in a well-ventilated area away from open flames and other sources of ignition. Review the Material Safety Data Sheets before handling any chemicals.

Scope and Application: For natural waters, drinking water, and groundwater

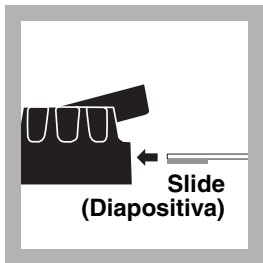
Introduction

Hach's new Arsenic test kit provides a simple, effective way to test for arsenic in the range of 0–500 ppb. The visual comparison test is ideal for use almost anywhere that trace amounts of total inorganic arsenic must be quantified. This new kit uses safe, easy-to-handle reagents packaged in unit doses, with a test strip to determine the final result. Up to 5 mg/L hydrogen sulfide in the sample can be tolerated. The design of the apparatus offers increased sensitivity (down to 10 ppb) and also minimizes exposure to arsine gas.

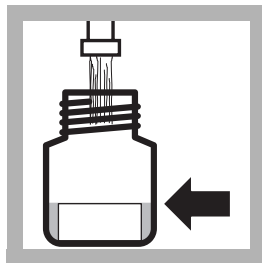
Tips and Techniques

1. Do not expose the **reacted** test strips to direct sunlight. The reaction products are photosensitive and will tend to darken, which may cause difficulty in color matching.
2. At no time should the solution in the reaction vessel come into direct contact with the test strip. The test strip reacts with gases released from the chemical reaction, not with the solution in the reaction vessel.
3. It is **critical** that the pad on the test strip **face downward**, centered over the hole in the black cap. If the placement of the test strip is incorrect, the generated gases may not contact the pad correctly and the final reading may be low.
4. Two reaction vessels and two black caps are provided to allow for the simultaneous analysis of two samples.

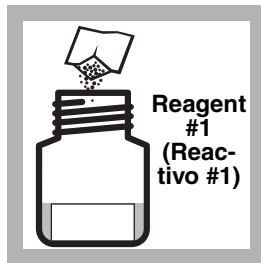
Procedure



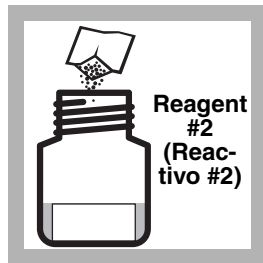
English 1. Lift the flap on the black cap and **slide** a test strip into the groove so that the reactive pad faces the small opening and completely covers it; secure by pressing the flap back in place.



2. Fill the reaction vessel with sample water to the fill line (50 mL).



3. Add the contents of 1 Reagent #1 powder pillow to the sample and swirl to dissolve.



4. Add the contents of 1 Reagent #2 powder pillow to the sample and swirl to dissolve.

Note: Solution may be cloudy at this point.

Español 1. Levante la trampilla encima del tapón negro y deslice una tira de prueba en la ranura, cuidando que la almohadilla reactiva mire hacia la abertura y la cubra completamente; cierre la trampilla presionándola.

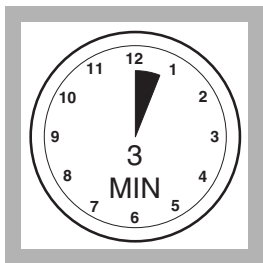
2. Llene el frasco de reacción con la muestra de agua hasta la marca (50 mL).

3. Agregue el contenido de 1 cápsula de polvo Reactivo #1 a la muestra y revolver para disolver.

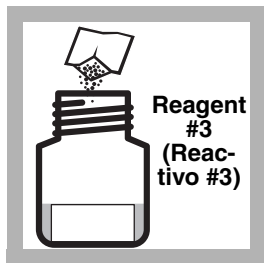
4. Agregue el contenido de 1 cápsula de polvo Reactivo #2 a la muestra y revuelva para disolver.

Nota: La solución se verá opaca en este punto.

English

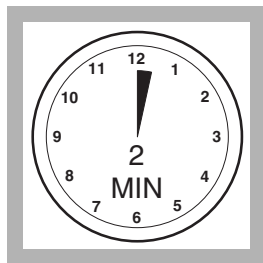


5. Wait at least 3 minutes.

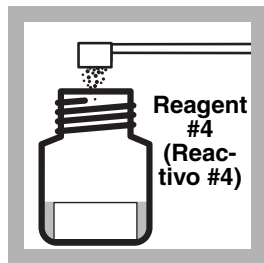


6. Add the contents of 1 Reagent #3 powder pillow to the sample and swirl to mix.

Note: *Not all of the powder will dissolve.*



7. Wait at least 2 minutes and swirl again to mix.



8. Using the plastic scoop, add 1 level scoop of Reagent #4 to the sample and swirl to mix.

Note: *Most of the powder will dissolve at this time.*

Español

5. Espere por lo menos 3 minutos.

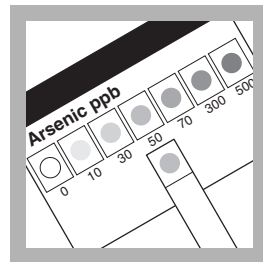
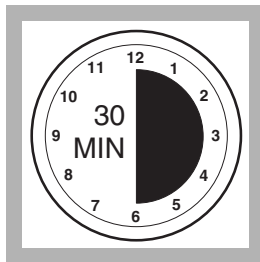
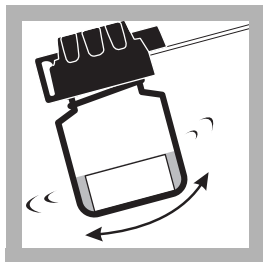
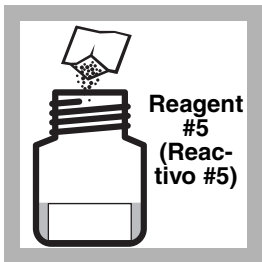
6. Agregue el contenido de 1 cápsula de polvo Reactivo #3 a la muestra y revuelva para disolver.

Nota: *No todo el polvo entrará en solución.*

7. Espere por lo menos 2 minutos y revuelva de nuevo para mezclar.

8. Empleando la cuchara plástica, agregue 1 cucharada rasa de Reactivo #4 a la muestra, y revuelva para mezclar.

Nota: *Ahora se disolverá la mayor parte del polvo.*



English

9. Add the contents of 1 Reagent #5 powder pillow to the sample.

10. Immediately attach the black cap, with the test strip inserted, to the reaction vessel. **Do not shake or invert!**

Swirl to mix. Do not allow sample to contact the test strip pad.

11. Allow vessel to react for 30 minutes, but no more than 35 minutes; swirl twice during the reaction period.

12. Remove the test strip and immediately compare the developed color to the chart on the test strip bottle.

Note: For best results, read the strip outdoors in a shady place. Direct sunlight will change the color of the strip.

Español

9. Agregue el contenido de 1 cápsula de polvo Reactivo #5 a la muestra.

10. Inmediatamente vuelva a tapar el frasco de reacción con el tapón negro con la tira de prueba inserta. **¡No sacuda ni invierta el frasco!**

Revuelva para mezclar. No permita que muestra tenga contacto con tira de prueba.

11. Deje que la reacción proceda por 30 minutos, pero no más de 35 minutos; revuelva 2 veces durante el período de la reacción.

12. Retire la tira de prueba y compare inmediatamente el color revelado con la carta de color pegada al recipiente de las tiras de prueba.

Note: Para lograr resultados más exactos, lea la tira de prueba afuera, pero en un sitio sombreado. La luz directa del sol alterará el color de la tira.

Interferences

The following were found to interfere:

Ion or Substance	Concentration
Sulfide	> 5 ppm
Selenium	> 1 ppm
Antimony	> 250 µg/L
Tellurium	Likely to interfere, but not tested

Other interferences are unlikely.

Summary of Method

Hydrogen sulfide is first oxidized to sulfate to prevent interference, and the oxidizing environment is then neutralized. Sulfamic acid and powdered zinc react to create strong reducing conditions in which inorganic arsenic is reduced to arsine gas (AsH_3). The arsine gas then reacts with mercuric bromide in the test strip to form mixed arsenic/mercury halogenides that discolor the test strip. The color ranges from yellow through tan to brown, depending on the concentration.

Organic Arsenic

Organic arsenic represents a small proportion of the arsenic in most systems. The instructions, as written for this test, are designed to detect inorganic arsenic. Organic arsenic compounds, such as dimethylarsenic acid, are not detected. To quantify inorganic and organic arsenic (total arsenic) with this kit, the following modification is needed: Collect 50 mL of sample in a glass beaker. Add the first two reagents according to the instructions. Place the beaker in a boiling water bath for 30 minutes. Remove the beaker from the water bath and transfer the contents to the reaction vessel. Allow the sample to cool to room temperature. Complete the procedure, beginning with step 6.

The following did not interfere at the levels tested:

Ion or Substance	Concentration
Hardness	1000 ppm as CaCO_3
Alkalinity	1000 ppm as CaCO_3
Iron	10 ppm
Temperature	10 to 40 °C

Required Reagents

Description	Unit	Cat. No.
Arsenic Test Kit Reagent Set.....	each.....	27999-00
Includes: Arsenic Test Strips and Arsenic Reagents #1 – #5		
Arsenic Test Strips.....	100/pkg.....	*
Arsenic Reagent #1, Powder Pillows	100/pkg.....	*
Arsenic Reagent #2, Powder Pillows	100/pkg.....	*
Arsenic Reagent #3, Powder Pillows	100/pkg.....	*
Arsenic Reagent #4	250 g.....	*
Arsenic Reagent #5, Powder Pillows	100/pkg.....	*
Cap, Santoprene	2/pkg.....	49348-00
Reaction Vessel, 50-mL fill line	2/pkg.....	28002-00
Scoop, 2 g, for 454-29.....	each.....	27998-00

* These items are not sold separately. Please order the complete reagent set (Cat. No. 27999-00) as a replacement.



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

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