Instruction Manual

HI 3845 Chromium Medium Range and High Range Test Kit

HANNA instruments

www.hannainst.com

Dear Customer,

Thank you for choosing a Hanna Product. Please read the instructions carefully before using the chemical test kit. It will provide you with the necessary information for correct use of the kit.

Remove the chemical test kit from the packing material and examine it carefully to make sure that no damage has occurred during shipping. If there is any noticeable damage, notify your Dealer or the nearest Hanna office immediately.

Each kit is supplied with:

- HI 3845A-0 Chromium MR-HR Reagent, packets (100 pcs);
- HI 3845B-0 Chromium MR-HR Reagent , 1 bottle (17 g);
- HI 3845C-0 Chromium MR-HR Reagent , 2 bottles with dropper (60 mL);
- Starch Indicator, 1 bottle with dropper (25 mL);
- 1 calibrated plastic vessel (20 mL);
- 1 plastic pipette (1 mL);
- 1 plastic test tube, graduated with cap;
- 1 spoon.

Note: Any damaged or defective item must be returned in its original packing materials.

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SPECIFICATIONS

Range	0 to 100 ppm Cr(VI) MR 100 to 1000 ppm Cr(VI) HR
Smallest Increment	5 ppm Cr(VI) MR 50 ppm Cr(VI) HR
Analysis Method	Drop-Count Iodometric Titration
Sample Size	5 mL MR 0.5 mL HR
Number of Tests	100 (average)
Case Dimensions	235x175x115 mm (9.2x6.9x4.5")
Shipping Weight	416 g (14.7 oz.)

SIGNIFICANCE AND USE

Chromium salts are widely used in industrial processes, such as metal finishing and plating industries, as well as in the leather industry as a tanning agent, and in the manufacture of paints, dyes, explosives and ceramics. Chromium may enter a water supply through the discharge of waste from these industries and may also be discharged from chromate-treated cooling waters, where they are frequently added for corrosion control. The hexavalent state of chromium is toxic to humans, animals and aquatic life. It can also produce lung tumors when inhaled and readily induces skin sensitization. The Hanna Chromium Test Kit is portable and can be used in the field as well as in the laboratory, being able to determine traces of chromium up to 1000 ppm.

Note: mg/L is equivalent to ppm (parts per million).

CHEMICAL REACTION

Chromate is determined by a titrimetric method. Only the hexavalent chromium will react with iodide in acid solution (Step 1): the amount of iodine generated is equivalent to the chromium in the sample. The liberated iodine is then titrated with standard sodium thiosulfate solution that reduces the iodine back to iodide ions (Step 2).

Step 1: $2CrO_4^{2-} + 16H^+ + 6I^- \rightarrow$

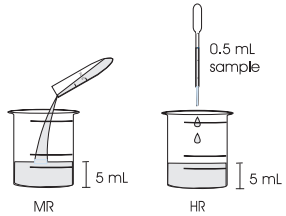
$\rightarrow 3I_2 + 8H_2O + 2Cr^{3+}$

Step 2: $I_2 + 2S_2O_3^{2-} \rightarrow 2I^- + S_4O_6^{2-}$

INSTRUCTIONS

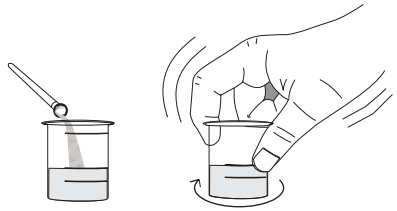
READ THE ENTIRE INSTRUCTIONS BEFORE USING THE KIT

- Remove the cap from the plastic vessel. Fill the vessel with 5 mL of sample using the graduated plastic test tube for Chromium Medium Range. In case of Chromium High Range fill the vessel with 0.5 mL of the sample by means of the 1 mL dropper and add D.I. water up to the 5 mL mark.



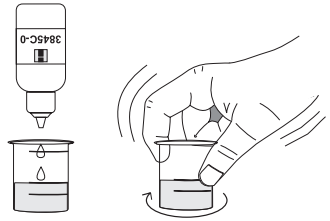
- Add 1 powder packet of HI 3845A-0 reagent and swirl gently to dissolve it.

- Using the plastic spoon provided, add 1 spoon of HI 3845B-0 reagent and swirl gently to mix.

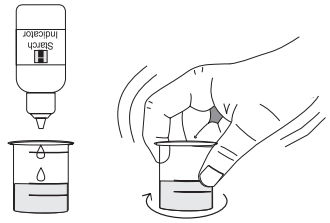


- Wait for 5 minutes to allow reaction to occur, leaving the plastic vessel closed and protected from direct sunlight.

- Begin the drop-count iodometric titration slowly adding drops of HI 3845C-0 reagent, while swirling the solution and counting the drops. Continue adding the titration reagent until the yellow color of the solution is almost disappeared.



- Add 2 to 3 drops of Starch Indicator and mix by carefully swirling the plastic vessel in tight circles. The solution will turn a blue color.



- Slowly add more drops of the HI 3845C-0 titration reagent, while swirling and counting the drops, until it changes from blue to colorless.
- To obtain the concentration in ppm of Chromate ion CrO_4^{2-} multiply the total number of drops of HI 3845C-0 reagent used from the beginning of titration by 5 or 50 respectively, based on whether Chromium Medium Range or Chromium High Range is being determined.

\# of DROPS * 5 = ppm Chromate (MR)

\# of DROPS * 50 = ppm Chromate (HR)

- To convert the concentration in ppm of Cr(VI) multiply the ppm of chromate by 0.45.
- To convert the concentration in ppm of Na_2CrO_4 multiply the ppm of chromate by 1.4.

Note: To measure Chromium in the 0-1.0 ppm range, use the **HI 3846** Chromium Test Kit.

REFERENCES

Vogel's, Textbook of quantitative chemical analysis, 5th ed., Longman Scientific and Technical

HEALTH AND SAFETY

The chemicals contained in this test kit may be hazardous if improperly handled. Read Health and Safety Data Sheets before performing the test.