

Chromium Ions (Cr+3) Rapid Test Strips (Water) (DTS803L)

This product is for research use only and is not intended for diagnostic use.

PRODUCT INFORMATION

Size 50T

Intended Use

The test strips is intended for rapid test of chromium ions in drink water.

General Description

Chromium is an odorless and tasteless metallic element. Chromium is found naturally in rocks, plants, soil and volcanic dust, and animals. The most common forms of chromium that occur in natural waters in the environment are: Trivalent chromium (chromium-3) and Hexavalent chromium (chromium-6). Trivalent chromium is an essential trace element for humans. Together with insulin it removes glucose from blood, and it also plays a vital role in fat metabolism. Chromium deficits may enhance diabetes symptoms. Chromium (III) toxicity is unlikely, at least when it is taken up through food and drinking water. It may even improve health, and cure neuropathy and encephalopathy. However, hexavalent chromium is known for its negative health and environmental impact, and its extreme toxicity. It causes allergic and asthmatic reactions, is carcinogenic and is 1000 times as toxic as trivalent chromium. Health effects related to hexavalent chromium exposure include diarrhoea, stomach and intestinal bleedings, cramps, and liver and kidney damage. Toxic effects may be passed on to children through the placenta. Chromium (VI) compounds are divided up in water hazard class 3, and are considered very toxic. If ingested as drinking water, hexavalent chromium (Cr-VI) is likely to be a carcinogen at a certain level, but studies are still being conducted to evaluate what level is unsafe and whether it does cause cancer or not. The United States Environmental Protection Agency (EPA) has a drinking water standard of 0.1 milligrams per liter (mg/L) or 100 parts per billion (ppb) for total chromium.

Principles of Testing

This test strip is based on the principle of immunochromatographic competition. The anti-Cr+3-EDTA monoclonal antibody-colloidal gold complex is coated on a colloidal gold binding pad to bind chromium-3 in the sample. The synthetic Cr+3-EDTA-BSA detection antigen was coated on the surface of the nitrocellulose film as the detection line (T line), and the goat anti-mouse IgG antibody was coated on the nitrocellulose film as the quality control line (C line). After 3 to 5 minutes, the test results are displayed visually according to the color.

Reagents And Materials Provided

1. Reducing agent: 60 mg/L NaHSO₃
2. EDTA: 10 mmol/L

Materials Required But Not Supplied

1. Pipette (20-200 μL , 100-1000 μL , 1-10 mL)
2. Consumables: gun tip, disposable gloves, centrifuge tube

Storage

The test strips and microwells should be stored in a cool and dry place at 2-8 $^{\circ}\text{C}$, avoiding freezing.

Specimen Collection And Preparation

1. Take a 1 mL water sample, add an equal volume of 60 mg/L NaHSO_3 solution, react at pH3.0 for 15min to reduce hexavalent chromium ions to trivalent chromium ions, and then chelate with EDTA.
2. Add 1/10 volume of EDTA (10 mmol/L) to the reduced solution, mix well and let stand for 3-5 min to prepare for detection.

Assay Procedure

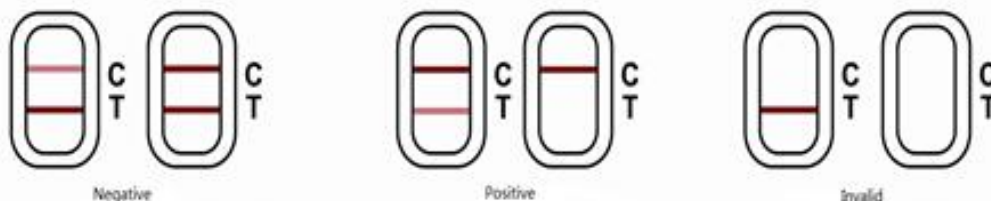
1. Insert a test strip into the centrifuge tube of well-mixed sample.
2. Let the test strip stand for 15 minutes and observe the result.

Interpretation Of Results

Negative (-): Color of Test Line(Line T) is deeper than Control Line(Line C) or the same color, indicating that the content of Chromium ions in sample is lower than the LOD (20ppb) of the kit.

Positive (+): No color shows in Test line(Line T) or Color of Test Line(Line T) is lighter than Control Line(Line C) indicating that the Chromium ions in sample is higher than the LOD (20 ppb) of the kit.

Invalid: No color shows in Control Line(Line C), indicating the operation is incorrect or the test kit is out of date. In this case, please read the instruction again carefully, and repeat the assay with a new test strip.



Detection Limit

The minimum detection limit of test strips for Chromium hexavalent ion is 20 ppb.

Specificity

The test strip was used to detect different metal-EDTA chelates, including Fe^{3+} , Al^{3+} , Mg^{2+} , Mn^{2+} , Hg^{2+} , Pb^{2+} , Cu^{2+} , Zn^{2+} , Ca^{2+} , Ni^{2+} . The results showed that the test strip tested positive for Cr^{3+} -EDTA standard, and other metal ions, except for Fe^{3+} -EDTA at the concentration of 1000 $\mu\text{g/L}$, all were negative.

Precautions

1. Please test according to the assay steps. Don't touch the white membrane surface in the center of the test card. Avoid the sunlight when testing.
2. The card is one-off, Please don't use it for twice time.
3. The solution of different batches should not be mixed.
4. Using the gloves when test.
5. The test result is only for reference. Please confirm according to the relative standard methods of country.