

## Iron Assay Kit (Spectrophotometry)

### Description

Iron is a metallic element that plays a crucial role in numerous biological processes, including iron transport and redox reactions. As a transition element, iron can exist in multiple oxidation states, with the most common being ferrous iron ( $\text{Fe}^{2+}$ , iron II) and ferric iron ( $\text{Fe}^{3+}$ , iron III). Iron-containing proteins participate in a wide range of biochemical reactions, often utilizing transient changes in iron oxidation states to drive chemical processes.

Serum iron refers to the iron bound to transferrin in the bloodstream. This parameter is commonly used to differentiate iron-deficiency anemia from non-iron-deficiency anemia.

### Detection Principle

Sodium sulfite reduces serum  $\text{Fe}^{3+}$  to  $\text{Fe}^{2+}$ , which subsequently reacts with 2,2'-bipyridine to form a colored complex with an absorption peak at 520 nm. The serum iron content can therefore be determined by measuring the absorbance at this wavelength.

### Packing

Taking 50T/48S packing for example:

Components	Packing	Storage
CB0201S-A	1 vial (powder) x 2	Store at 4°C. Prepare freshly before use and dissolve completely in 10 mL of distilled water.
CB0201S-B	1 vial (powder) x 2	Store at 4°C. Prepare fresh before use by adding 313 $\mu\text{L}$ of glacial acetic acid, then add 10 mL of distilled water and dissolve thoroughly.
CB0201S-Standard	1 vial (solvent) x 1	100 $\mu\text{mol/L}$ $\text{Fe}^{3+}$ standard solution, stored at -20°C.

\* Before formal testing, perform a preliminary test using 2–3 samples with relatively large expected differences.

### Instructions

#### I. Self-Prepared Equipment

Visible spectrophotometer, 1 mL glass cuvette, refrigerated centrifuge, water bath, adjustable pipette, glacial acetic acid, chloroform, and distilled water.

#### II. Sample Handling

Direct detection in serum (plasma)

#### III. Assay Procedure

- Preheat the spectrophotometer for at least 30 minutes, set the wavelength to 520 nm, and use distilled water to zero the instrument.
- Standard solution thawing: Remove the standard solution in advance and allow it to thaw completely at room temperature, then mix thoroughly.
- Sample measurement (add the following reagents sequentially into EP tubes):

	Blank Tube ( $\mu\text{L}$ )	Standard Tube ( $\mu\text{L}$ )	Sample Tube ( $\mu\text{L}$ )
Distilled Water	400		
CB0201S-A	400	400	400
CB0201S-B	400	400	400
CB0201S-Standard Solution		400	
Serum			400
Mix thoroughly, cap tightly, incubate in a boiling water bath for 5 minutes, then cool with running tap water.			
Chloroform (self-prepared)	200	200	200

Mix thoroughly by vortexing. Centrifuge at 10,000 rpm for 10 min at room temperature. Carefully transfer 700  $\mu$ L of the upper layer into a 1 mL glass cuvette, and measure the absorbance at 520 nm. Record the values as A\_blank, A\_standard, and A\_sample, respectively.

\* The blank tube only needs to be measured once.

#### IV. Calculation of Iron Concentration

Serum Iron Content ( $\mu$ mol/L) =  $C \times (A1 - A2) \div (A3 - A2) = 100 \times (A1 - A2) \div (A3 - A2)$

A1: A\_sample

A2: A\_blank

A3: A\_standard

C: 100  $\mu$ mol/L Fe<sup>3+</sup> standard solution

#### Precautions

1. The serum iron content is low, so special attention should be paid to the containers used (e.g., EP tubes) to avoid iron contamination.
2. The solutions CB0201S-A and CB0201S-B are unstable and should be freshly prepared before use. Newly prepared reagents should be used up on the same day.
3. The product is for R&D use only, not for diagnostic procedures, food, drug, household or other uses.
4. Please wear a lab coat and disposable gloves.

#### TargetMol US

 sales@targetmol.com  (781) 999-4286  www.targetmol.com

 34 Washington Street, Suite 220, Wellesley Hills, MA 02481

#### TargetMol EU

 sales@targetmol.com  +43(0)676/786025  www.targetmol.com

 Hafenstraße 47-51, 4020 Linz, Austria



LinkedIn



Facebook



PDF Documents