Magnesium Assay Kit

（Cat/No.:BC067　Size:100T/96S）

1. Principle of Measurement: (Colorimetric method)

Magnesium in serum reacts with the complexometric indicator Calmagite to form a Calmagite-magnesium complex. The absorbance of this complex at 540 nm (ranging from 500 to 550 nm) is directly proportional to the magnesium concentration in the sample. EDTA is added to the reagent to eliminate interference from calcium; potassium cyanide (KCN) is incorporated to prevent the formation of heavy metal complexes; and surfactants are included to inhibit interference from serum proteins, thereby avoiding a shift in the absorption peak of the Calmagite-magnesium complex.

2. Determination of significance

This kit is intended for the in vitro quantitative determination of magnesium concentration in animal serum and plasma.

Magnesium serves as a cofactor for numerous intracellular enzymes, including all enzymes using ATP as a substrate. It is present in all soft tissues and bones, with an approximately equal distribution between the two. Both hypomagnesemia and hypermagnesemia can occur. The metabolic mechanism of magnesium remains unclear: elevated magnesium levels induce decreased muscle tone, which is observed in conditions such as renal failure and liver diseases. In contrast, symptoms caused by reduced magnesium levels are similar to those of hypocalcemia, and this is mostly associated with excessive magnesium loss—for example, chronic severe diarrhea, diuretic therapy, primary aldosteronism, and other related disorders.

3. Composition and Preparation

Reagent 1: Liquid, 50 mL × 1 bottle

Reagent 2: Liquid, 50 mL × 1 bottle

Preparation of the working solution: Mix Reagent 1 and Reagent 2 in equal volumes, mix thoroughly, and allow to stand for 10 minutes to prepare the working solution. Prepare fresh before use; store at 4℃ for up to 3 days.

Magnesium standard solution: 1.5mmol/L

4. Operation Table

	Blank well	Standard well	Sample well
Work fluid(mL)	1.0	1.0	1.0
Incubate at 37℃ for 5 minutes			

DDW(mL)	0.01		
1.5mmol/LMagnesium standard solution(mL)		0.01	
Test Sample			0.01
Mix thoroughly, incubate at 37℃ for 1–2 minutes, set wavelength at 540 nm with a 0.5 cm light path, zero with double-distilled water, and measure the absorbance of each tube.			

5. Calculation

$$\frac{Mg^{2+}}{mM} = \frac{OD_{Sample} - OD_{Blank}}{OD_{Standard} - OD_{Blank}} \times \frac{C_{Standard}}{1.5mM}$$

6. Technical performance indicators of the kit

1. Reagent blank initial absorbance(540nm 37℃):≤0.6A
2. Linear range:2.0mmol/L±10%
3. Accuracy: Relative Deviation(RE%)≤±10%
4. Precision:
   Intra-assay precision: Coefficient of variation(CV%)≤5%
   Inter-assay precision: Relative range(%)≤5%

7. Notes

1. According to the requirements of different instruments, the amounts of reagents and samples can be adjusted proportionally.
2. The reagents must not be sucked up with your mouth. If they get contaminated, you should immediately rinse them with plenty of running water.
3. This method does not have strict temperature regulations, but the temperature should be kept constant as the color is sensitive to temperature changes.
4. Lipid blood samples may yield false high values. In such cases, blank sample tubes can be used for correction. The method is as follows: Add 10 μL of the sample to 1.0 mL of physiological saline to serve as the sample blank tube. At 540nm, zero the instrument with normal saline, read the absorbance value of the sample blank tube, then subtract the absorbance value of the sample blank tube from the absorbance value of the sample tube, and calculate the result.Or: After reading the absorbance of the sample tube and the blank tube, 10 μL of 0.5% EDTA solution was added to the sample tube and the blank tube respectively. The tubes were mixed and re-read. The difference between the two readings is the measured value after removing lipemia.
5. The color of the reaction solution of this method can remain stable for 1 hour.
6. International unit conversion: mmol/L×2.43=mg/dL