

Magnesium Assay Kit (Colorimetric)

LS-K220-250 (250 Tests) • Store at 4°C



Introduction

Magnesium (Mg) is one of the most abundant and essential minerals in mammals. Magnesium is involved in more than 300 biochemical reactions in the body and plays important roles in muscle and nerve functions, heart rhythm, immune system and bone formation. Magnesium deficiency may lead to nausea, fatigue, muscle contractions, hypocalcemia and hypokalemia.

Simple, direct and automation-ready procedures for measuring magnesium concentration in biological samples are becoming popular in Research and Drug Discovery. This magnesium assay kit is designed to measure magnesium directly in biological samples without any pretreatment. A calmagite dye in the kit forms a colored complex specifically with magnesium. The intensity of the color, measured at 500 nm, is directly proportional to the magnesium concentration in the sample. The optimized formulation minimizes interference by potential substances.

Key Features

- Sensitive and accurate. Use as little as 5 μ L sample. Linear detection range 0.1 mg/dL (41 μ M) to 3 mg/dL (1.2 mM) Mg^{2+} in 96-well plate assay.
- Simple and high-throughput. The procedure involves addition of two reagents and measuring OD_{500nm}. Can be readily automated as a high-throughput assay for thousands of samples per day.
- Improved reagent stability and versatility. The optimized formulation has greatly enhanced reagent and signal stability. Cuvette or 96-well plate assay.
- Low interference in biological samples. Assays can be directly performed in serum and urine samples.

Applications

- Direct Assays: Mg^{2+} in serum, urine and deproteinated samples (e.g. milk) etc.
- Drug Discovery/Pharmacology: effects of drugs on Mg^{2+} metabolism.
- Food and Beverages: Mg^{2+} determination.
- Environment: Mg^{2+} determination in water and soil.

Components

Component	K220-250
	250 Tests
Reagent A	25 mL
Reagent B	25 mL
EDTA Solution	2 x 1.5 mL
Standard (10 mg/dL Mg^{2+})	1 mL

Materials Not Supplied

Pipetting devices and accessories (e.g. 5 μ L).

Procedure using 96-well plate: Clear bottom 96-well plates (e.g. Corning Costar) and plate reader.

Procedure using cuvette: Cuvettes and spectrophotometer for measuring OD_{500nm}.

FOR RESEARCH USE ONLY! Not for use in humans.

LifeSpan BioSciences, Inc. • 2401 Fourth Avenue, Suite 900, Seattle, WA 98121

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Storage

The kit is shipped at room temperature. Store Reagent and Standard at 4°C. Shelf life: 12 months after receipt.

Assay Procedure

Reagent Preparation: Prepare enough working reagent by combining equal volumes of Reagent A and Reagent B. Equilibrate to room temperature before use.

Procedure using 96-well plate:

1. Dilute standard to 2 mg/dL by mixing 40 µL 10 mg/dL Standard with 160 µL distilled water. Transfer 5 µL diluted standard and samples in duplicate to wells of a clear bottom plate. Diluted standard can be stored at 4°C for future use.
2. Add 200 µL working reagent and tap plate to mix thoroughly.
3. Incubate 2 min at room temperature and read optical density at 500 nm (OD for sample and standard).
4. Add 10 µL EDTA Solution to all sample wells and tap plate to mix thoroughly. Incubate 2 min and read OD at 500nm (OD for blanks).

Procedure using cuvette

1. Set up test tubes and transfer 25 µL diluted Standard and samples to appropriately labeled tubes.
2. Add 1000 µL working reagent and vortex to mix. Incubate 2 min. Transfer to cuvette and read OD_{500nm}. Add 50 µL EDTA solution, mix well, incubate 2 min and read OD_{500nm}.

Calculations

Magnesium concentration of the sample is calculated as

$$= \frac{OD_{\text{SAMPLE}} - OD_{\text{BLANK}}}{OD_{\text{MG}} - OD_{\text{MGBlank}}} \times 2 \text{ (mg/dL)}$$

OD_{SAMPLE} and OD_{BLANK} are OD_{500nm} values of sample before and after the addition of EDTA. OD_{MG} and OD_{MGBlank} are OD_{500nm} values of the standard (2 mg/dL) before and after the addition of EDTA.

Conversions: 1 mg/dL Mg²⁺ equals 411 µM, 0.001% or 10 ppm.

General Considerations

1. EDTA and other Mg²⁺ chelators interfere with this assay. This assay cannot be applied to plasma samples obtained with EDTA.
2. Sample pretreatment: for milk and other lipid/protein-rich samples, mix equal volumes of sample and 10% trichloroacetic acid (Sigma Cat# T6399). Incubate 5 min at room temperature and pellet precipitates for 2 min at 14,000 rpm in a table centrifuge. Assay the supernatant (dilution factor = 2) using the above procedure.

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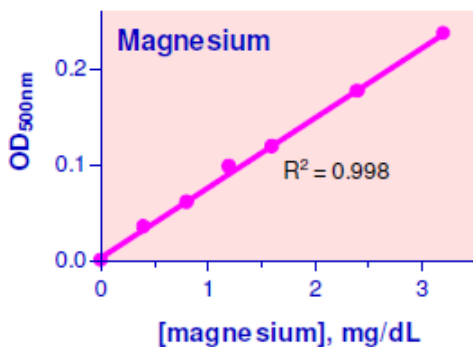
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Sample Data

Samples were assayed in duplicate using the 96-well plate protocol. The Mg^{2+} values (mg/dL) were 1.64 ± 0.04 (rat serum), 1.77 ± 0.02 (human serum), 2.41 ± 0.5 (goat serum), 2.80 ± 0.14 (Invitrogen fetal bovine serum).



Standard Curve in 96-well plate assay

Version: V.08.09.2018

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