

MAGNESIUM-L (R1-R2)

(Calmagite)

CHEMPAK

Last update 05-2023

Ref. CC1-MAG.056, 20x1 Test

INTENDED USE

The reagent is intended for *IN-VITRO* quantitative determination of magnesium in human serum or plasma and urine.

INTRODUCTION

An essential element which influences many enzymes which is needed to produce cellular energy and nerve and muscle message transmission. It affects nervous, muscular and cardiovascular systems. Magnesium is found mainly in bone, also in muscle and other tissues, deficiency can lead to neuromuscular and central nervous system irritability, muscle twitches and weakness. Elevated Magnesium has been found to result in mental depression and cardiac arrest.

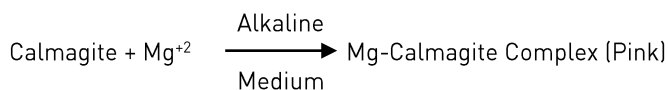
DIAGNOSTIC SIGNIFICANCE

Magnesium is one of the most abundant cations in the body and is essential to many physiological processes. Approximately in one half of the body Magnesium is present in the bone, most of the soft tissues and blood cells with a small amount present in the blood.

Decreased levels have been observed in cases of diabetes alcoholism, diuretics, hyperthyroidism, malabsorption, myocardial infarction, congestive heart failure and liver cirrhosis. Increased magnesium serum levels have been found in renal failure, diabetic acidosis, Addison's disease and Vitamin D intoxication.

PRINCIPLE

Magnesium forms a purple coloured complex when treated with Calmagite dye in alkaline solution. The chelating agent and detergent present in the reagent will help out to remove interference occurred from Calcium and Proteins. The intensity of the purple colour is proportional to magnesium concentration.



PRESENTATION

All reagents to be stored at 2-8°C	No. of Bottles / Vials
	20x1 Test
• 1 Magnesium (Alkali)	20
• 2 Magnesium (Dye)	1
• Magnesium Standard (2 mg/dl)	1

FINAL REAGENT COMPOSITION

Active Ingredients	Concentration
• Potassium Hydroxide	25 mmol/L
• Detergent	5 mmol/L
• Potassium Chloride	100 mmol/L
• Calmagite	0.2 mmol/L
• pH 12.5 ± 0.1 at 25°C	

Magnesium Standard (2 mg/dl)

Also contains non-reactive fillers and Stabilizers.

PRECAUTION

Care must be taken to avoid magnesium contamination. The use of disposable plastic tubes or cuvettes is strongly recommended. The user should assure themselves that such disposables are free from magnesium contamination. If glassware is used, it should be soaked in dilute 1N HCl or a strong laboratory cleanser and thoroughly rinsed with distilled or deionised water.

PREPARATION OF WORKING REAGENT

Add 0.5 ml 2 Magnesium to the vial of 1 Magnesium.

REAGENT STORAGE & STABILITY

Working reagent is stable for 21 days at 2-8°C.

SPECIMEN COLLECTION

Serum of heparinised plasma. Don't use citrate oxalate or EDTA as anticoagulants.

Magnesium in Serum Sample is stable for one week at 2-8°C. Hemolyzed sample should be discarded.

FOR URINE

Twenty four hours urine is collected and should be acidified to a pH 2-3 by the addition of approx 10 to 15 ml conc. HCl and diluted 1+3 with Distilled Water before use. Multiply results by 4.

REACTION PARAMETERS

• Type of reaction	: End point
• Flowcell Temperature	: 30°C / 37°C
• Wavelength	: 520 nm
• Reagent Volume	: 1ml
• Sample Volume	: 0.01 ml (10 µl)
• Reaction time	: 5 min.
• Cuvette Pathlength	: 1.0 cm
• Zero setting with	: Distilled water

TEST PROCEDURE

Pipette into Test Tubes	Blank	Standard	Sample
Working Reagent (ml)	1.0	1.0	1.0
Standard (ml)	-	0.01	-
Sample (ml)	-	-	0.01

TEST RESULTS

$$\text{Magnesium (mg/dl)} = \frac{\text{Absorbance of Sample}}{\text{Absorbance of Standard}} \times 2 \text{ mg/dl}$$

To convert result into mmols, multiply the results with 0.412.

LIMITATIONS FOR INTERFERENCE

- Haemolysis will produce falsely elevated results because of the high concentration of intracellular magnesium.
- Calcium present at a concentration 7.5 mmol/L, will interfere with this method.

NORMAL VALUES

Serum or Plasma : 1.6 - 2.5 mg/dl
0.66 - 1.03 mmol/Liter

Urine : 60-210 mg/24 hr.

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LINEARITY

This method is linear upto 4.5 mg/dl. If the concentration is greater than 4.5 mg/dl, dilute the sample with saline and apply necessary dilution factor for calculation.

NOTE

Use disposable plastic tips for pipetting.

REFERENCES

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