

MAGNESIUM

(CALMAGITE METHOD)

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.

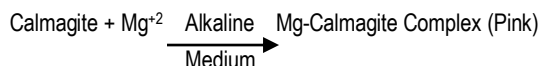
CLINICAL SIGNIFICANCE:

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.



REAGENT COMPOSITION

Active Ingredients	Concentration
Reagent-1	
* Potassium Hydroxide	25 mmol/L
* Detergent	5 mmol/L
pH 12.5 ± 0.1 at 25°C	
Reagent-2	
* Potassium Chloride	100 mmol/L
* Calmagite	0.2 mmol/L

Magnesium Standard (2 mg/dl)

Also contains non-reactive fillers and Stabilizers.

PRESENTATION :

	No. of Bottles / Vials
All reagents to be stored at -2-8°C	15 Tests
1 Magnesium (Alkali)	1
2 Magnesium (Dye)	15
Magnesium Standard (2 mg/dL)	1

WORKING REAGENT PREPARATION:

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

REAGENT STORAGE & STABILITY:

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

SAMPLE COLLECTION & HANDLING:

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

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.

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

REACTION PARAMETERS :

Type of reaction	:	End point
Flowcell Temperature	:	30 / 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

PROCEDURE:

	BLANK	STANDARD	SAMPLE
* Working Reagent	1.0 ml	1.0 ml	1.0 ml
* Standard	-	0.01 ml	-
* Sample	-	-	0.01 ml

CALCIUM:

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

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

LIMITATIONS:

- 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 HCl or a strong laboratory cleanser and thoroughly rinsed with distilled or deionised water.
- 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 (mg/dl)	:	(1.6 - 2.5 mg/dl) (0.66 - 1.03 mmol/Liter)
Urine (mg/24hr.)	:	(60-210 mg/24 hr.)

NOTE:

Use disposable plastic tips for pipetting.

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.



REFERENCES:

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