SPECTRUM

The Creative Approach to Bioscience

MAGNESIUM
Phosphonazo III

REF: 285 001 (2 x 25 ml) 50 Test
REF: 285 002 (4 x 25 ml) 100 Test

SYMBOLS IN PRODUCT LABELLING

EC REP Authorised Representative	Use by/Expiration Date
IVD For in-vitro diagnostic use	CAUTION. Consult instructions for use
LOT Batch Code/Lot number	Manufactured by
REF Catalogue Number	(Xi) - Irritant
Consult instructions for use	
Temperature Limitation	

Intended Use

Spectrum Diagnostics Magnesium reagent is intended for in-vitro quantitative, diagnostic determination of Magnesium in human serum, plasma and urine on both manual and automated systems.

Background

Magnesium is an activator for various physiochemical processes, including phosphorylation, protein synthesis and DNA metabolism. It is also involved in neuromuscular conduction and excitability of skeletal and cardiac muscle.Ingested magnesium is absorbed in the intestine and the amount absorbed is inversely related to the total magnesium intake. The kidneys effectively control magnesium homeostasis through tubular reabsorption, which conserves magnesium when intake is low and excretes excess when intake is high.Increased serum magnesium concentrations occur in renal failure, acute diabetic acidosis, dehydration or Addison's disease. Hypermagnesemia has a depressing effect on the central nervous system, causing general anesthesia and respiratory failure. It alters the conduction mechanism of the heart, causing cardiac arrest. Hypomagnesiumia may be observed in chronic alcoholism, malabsorption, severe diarrhea, acute pancreatitis, diuretic therapy, prolonged parenteral fluid therapy without magnesium supplementation and the kidney disorders such as glomerulonephritis and tubular reabsorption defects.

Method

Phosphonazo III , Colorimetric Endpoint.

Assay Principle

Magnesium ions form a colored chelate complex when reacting with Phosphonazo III, the intensity of the color is proportional to the magnesium concentration. Calcium ions are masked by EGTA.

Reagents

Standard (S)
2.5 mg/dL 1.03 mmol/L

Reagent (R)

MOPS (pH 6.8)	1	mol/L
EGTA	60	µmol/L
Phosphonazo III	110	µmol/L

For further information, refer to the Magnesium reagent material safety data sheet.

Precautions and Warnings

Do not ingest or inhalate. In case of contact with eyes or skin; rinse immediately with plenty of soap and water. In case of severe injuries; seek medical advice immediately.

Reagent Preparation, Storage and Stability

The reagents are supplied ready to use.Magnesium reagent is stable up to the expiry date stated on the vial label when stored at 2-8 ^{o}C.Once opened , the reagent and standard are stable for 3 months at the specified temperature if contamination is avoided.

Deterioration

Failure to recover control values within the assigned range may be an indication of reagent deterioration.

Specimen collection and preparation

Serum, Plasma (free from haemolysis) and Urine
The only acceptable anticoagulant is Heparin.
Serum with any visible haemolysis cannot be used because of the large amount of magnesium released from the erythrocytes. The specimen should be separated from the clot as soon as possible to prevent falsely elevated magnesium due to passage of magnesium from the erythrocytes into the serum.
EDTA, Sodium fluoride and oxalate should be avoided because they interfere with the results.

System Parameters

Wavelength	630 nm
Optical path	1 cm
Assay type	End-point
Direction	Increase
Temperature	25 ^{o}C
Zero adjustment	Reagent blank
Sensitivity	0.2 mg/dL
Linearity	5.0 mg/dL

Procedure

	Blank	Standard	Sample
Reagent	1.0 ml	1.0 ml	1.0 ml
Standard	…….	10 µl	…….
Sample	……..	……..	10 µl

Mix well and let stand 10 minutes at room temperature .
Then,read the absorbance of sample and standard against reagent blank.
The color is stable for at least 1 hour.

Calculation

$$\text{Serum Magnesium conc. (mg/dL)} = \frac{(A_{specimen})}{(A_{standard})} \times 2.5$$

Quality Control

Normal and abnormal commercial control serum of known concentrations should be analyzed with each run.

Performance Characteristics

Precision

Within run (Repeatability)

	Level 1	Level 2
n	20	20
Mean (mg/dL)	1.95	3.4
SD	0.02	0.12
CV%	1.03	3.53

Run to run (Reproducibility)

	Level 1	Level 2
n	20	20
Mean (mg/dL)	1.95	3.4
SD	0.02	0.13
CV%	1.03	3.82

Methods Comparison

A comparison between Spectrum Diagnostics Magnesium reagent and a commercial reagent of the same methodology was performed on 20 human sera. A correlation of 0.995 was obtained.

Sensitivity

When run as recommended, the minimum detection limit of the assay is 0.2 mg/dL.

Linearity

The reaction is linear up to a Magnesium concentration of 5.0 mg/dl; specimens showing higher concentration should be diluted 1+1 using physiological saline and repeat the assay (result × 2).

Interfering Substances

Haemoglobin
It interferes because magnesium is released by erythrocytes.

Icterus
No significant interference up to a bilirubin level of 40 mg/dL.

Lipemia
No significant interference up to 2000 mg/dl

Calcium
No significant interference up to 25mg/dl

Drugs
No interference was observed by ascorbic acid up to 30 mg/dl

Spectrum Diagnostics does not interpret the results of a clinical laboratory procedure; interpretation of the reults is considered the responsibility of qualified medical personnel. All indications of clinical significance are supported by literature references.

Expected Values

The following guidelines may be used for clinical interpretation:

Serum/Plasma:

Newborn	1.2 - 2.6 mg/dl	(0.48 - 1.05 mmol/l)
Children	1.5 - 2.3 mg/dl	(0.60 - 0.95 mmol/l)
Women	1.9 - 2.5 mg/dl	(0.77 - 1.03 mmol/l)
Men	1.8 - 2.6 mg/dl	(0.73 -1.06 mmol/l)

Urine: 1-10 mg/dl
73-122 mg/24h (3 -5 mmol/24h)

C.S.F.: 2.4 - 3.5 mg/dl

Dynamic Range

0.2 - 5.0 mg/dl.

Waste Disposal

This product is made to be used in professional laboratories.
Please consult local regulations for a correct waste disposal.
S56: dispose of this material and its container at hazardous or special waste collection point.
S57: use appropriate container to avoid environmental contamination.
S61: avoid release in environment. refer to special instructions/safety data sheets.

References

1. Thomas L. Clinical Laboratory Diagnostics 1st ed Frankfurt: TH-Books Verlagsgesellschaft; 1998. p. 231-41.
2. Mann ck,yoe JH. Spectrophotometric determination of Mg Anal. chem Acta 1957; 16: 155 - 60

ORDERING INFORMATION	
CATALOG NO.	**QUANTITY**
285 001	2 x 25 ml
285 002	4 x 25 ml

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