

MAGNESIUM Xylidyl Blue Monoreagent

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

Intended Use

Spectrum Diagnostics Magnesium reagent is intended for in-vitro quantitative, diagnostic determination of Magnesium in human serum 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.

Hypomagnesemia 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

Xylidyl Blue, Colorimetric Endpoint.

Assay Principle

Magnesium ions form a colored chelate complex when reacting with xylidyl blue in alkaline solution, the intensity of the color is proportional to the magnesium concentration. Calcium ions are masked by GEDTA.

Reagents

Standard cholesterol (ST)

2.5 mg/dL 1.0 mmol/L (1.03mmol/l)

R: Reagent

Ethanolamine	pH 11.0	1	mol/L
GEDTA (Glycoetherdiamin-tetraacetic acid)		60	µmol/L
Xylidylblue		110	µmol/L

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

Precautions and Warnings










Do not ingest or inhale. 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.

Avoid contamination by using clean laboratory material (pipette, plastic vial for analyzers,...)

Reagent Preparation, Storage and Stability

The reagents are supplied ready to use. Magnesium reagent is stable up to the expiry date labeled on the bottles when stored at 2 - 8 °C.

SYMBOLS IN PRODUCT LABELLING

	Authorised Representative		Temperature Limitation
	For in-vitro diagnostic use		Use by/Expiration Date
	Batch Code/Lot number		CAUTION. Consult instructions for use
	Catalogue Number		Manufactured by
	Consult instructions for use		

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	546 nm (500 – 550 nm)
Optical path	1 cm
Assay type	End-point
Direction	Increase
Temperature	25 °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 absorbance of sample and standard against reagent blank. The color is stable for at least 1 hour.

Calculation

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

Quality Control

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

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:

Interferences are found according to the literature.

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	(3-5mmol/24h)

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

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

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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