

## MAGNESIUM Colorimetric

### Intended use

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

### 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.

### Method

Colorimetric Endpoint.

### 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.

Increased serum magnesium concentrations occur in renal failure, acute diabetic acidosis, dehydration or Addison's disease. Hypomagnesaemia 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. Hypomagnesaemia 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.

### Reagents

#### Standard (S)

2.5 mg/dL

#### Reagent (R)

MOPS

EGTA

Phosphonazo III

### Reagent Storage and Stability

All reagents are stable until expiration date stated on label when stored refrigerated at 2 - 8 °C.

### Specimen collection and preparation

Serum, Plasma (free from haemolysis) and Urine. The only acceptable anticoagulant is Heparin.

### System Parameters

Wavelength	630 nm
Optical path	1 cm
Assay type	Endpoint
Direction	Increase
Temperature	25°C
Zero adjustment	Reagent blank
Sensitivity	0.2 mg/dL
Linearity	5.0 mg/dL

### Procedure

#### 1.

	Blank	Standard	Sample
Reagent	1.0 ml	1.0 ml	1.0 ml
Standard	----	10 µl	----
Sample	----	----	10 µl

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

### Calculation

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

### Expected values

#### 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

### 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

## References

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

### Symbols key

Manufactured by	For in-vitro diagnostic use	Lot number	Expiration Date
			
Temperature Limitation	Catalogue Number	Consult instructions for use	
