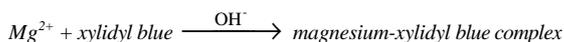


Reagent kit for determination of magnesium ion concentration in serum and urine. A colorimetric xylydyl blue complex method.

Magnesium is an essential cofactor of several enzymes involved in the carbohydrate metabolism, synthesis of proteins and nucleic acids as well as muscular contraction. Further magnesium ions play an important role in neuromuscular transmission of stimuli and in the mechanism of calcium ion channel. Decreased serum magnesium levels are associated with chronic renal disease, haemodialysis, hepatic cirrhosis, gestational toxicosis, chronic alcoholism, aldosteronism as well as conditions with diarrhoea. Elevated serum magnesium concentrations are found in cases of dehydration, impaired renal function, hypothyroidism and Addison's disease.

Principle

Magnesium ion forms a colored complex with xylydyl blue under alkaline conditions. The intensity of the developed color is proportional to the magnesium ion concentration of the sample.



Reference values

Serum: 0.65-1.03 mmol/l (1,6-2,5 mg/dl)
It is recommended that each laboratory should assign its own normal range.

Reagents

1.Reagent (R1)

TRIS buffer pH=11.30 250 mmol/l
Xylydyl blue 1 mmol/l
Detergent

2. Magnesium standard

Ready for use. For details please check the insert.
Available only in Cat. No.: 45751S

Samples

Serum free of haemolysis. Urine (diluted in ratio of 1:10 with distilled water). The sample should be adjusted to pH 3 - 4 with diluted hydrochloric acid.

For sampling and assay use plastic equipments only.

PROCEDURE

Working reagent

The reagent is ready for use.
If the absorbance of working reagent is higher than 1.2 at 492 nm the reagent can not be used

Assay conditions

Wavelength: 500 (480-520) nm
Temperature: 37 °C
Cuvette: 1 cm pathway
Method: endpoint (increasing)

Pipette into cuvette

	Blank	Standard	Sample
Standard		10µl	
Sample			10µl
Working reagent	1 ml	1 ml	1 ml

Mix and incubate for 5 minutes then read the absorbance against blank.

Calibration (37°C, xylydyl blue method)

S1: Distilled water
S2: Magnesium standard Cat. No.: 52201 or Roche C.F.A.S. (Calibrator for automated system)
Randox Calibration Serum Level I or Randox Calibration Serum Level II

Calibration frequency

Two point calibration is recommended:
- after reagent lot change,
- as required following quality control procedures.

Calculation

$$\frac{A_{\text{sample}}}{A_{\text{standard}}} \times C_{\text{standard}} = C_{\text{sample}}$$

A = Absorbance, C = Concentration

Quality control

A quality control program is recommended for all clinical laboratories. The analysis of control material in both the normal and abnormal ranges with each assay is recommended for monitoring the performance of the procedure. Each laboratory should establish corrective measures to be taken if values fall outside the limits.

PERFORMANCES DATA

The following data were obtained using the Olympus 600 analyzer.

Linearity

The test is linear up to 2.5 mmol/l (6,08 mg/dl)

Sensitivity

It is recommended that each laboratory establishes its own range of sensitivity as this is limited by the sensitivity of the spectrophotometer used. Under manual conditions however, a change of 0.001 Abs is equivalent to 0.004 mmol/l (0,01mg/dl) magnesium concentration at 578 nm.

Precision

	Reproducibility		
	Average conc. (mmol/l)	SD	CV%
Sample I.	1.06	0.029	2.76
Sample II.	1.80	0.038	2.11

Correlation

Comparative studies were done to compare our reagent with another commercial magnesium xylydyl blue assay.

The results from these studies are detailed below.

Correlation coefficient: r = 0.9890

Linear regression: y (mmol/l) = 0.972x + 0.057

(x= other commercial reagent, y= own reagent).

Specificity

Bilirubin 855µmol/l (50mg/dl), lipid 1000mg/dl, glucose 55.5mmol/l (1000mg/dl) and ascorbic acid 2.84mmol/l (50mg/dl) don't interfere with the assay up to the given levels.

Note

The dilution factor should be considered at the calculation of magnesium ion concentration of urine. Do not use reagents after the expiry date stated on each reagent container label. Do not use products, test solutions and reagents described above for any purpose other than described herein.

For in vitro diagnostic use only.

The following symbols are used on labels

 For in vitro diagnostic use

 Use by (last day of the month)

 Temperature limitation

 Batch Code

 Code

Bibliography

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