MAGNESIUM XB LS Mono

IVD

Quantitative determination of Magnesium in Serum, Plasma, Urine, CFS. Xylidyl blue Colorimetric method.

REF **CC1260** R1: 4x60 mL + R2: 1x3 mL (standard)

METHOD AND PRINCIPLE

Magnesium ion forms a purple compound when it is complex with Xylidyl Blue in an alkaline solution. In the presence of EGTA which subtracts the calcium antagonist ions, the reaction is very specific. The intensity of the produced color, measured against a calibrator at 510 nm, is directly proportional to the magnesium concentration in the sample.

CLINICAL SIGNIFICANCE

Deficiency of magnesium is a quite common disorder which can be caused by malnutrition, malabsorption, renal loss and endocrinological disturbances. Complications associated with decreased magnesium concentrations are neuromuscular irritability (e.g. Tremor, seizures) and cardiac symptoms (e.g. tachycardia, arhythmia). Decreased magnesium concentrations are often related to decreased calcium and potassium levels, taking into account that hypomagnesemia may be the primary cause of hypocalcemia. Elevated magnesium values can be observed in dehydration, renal disorders and after intake of excessive amounts of antacids and can be associated with weakness of reflexes and low blood pressure.

REAGENTS COMPOSITION

Reagent (R1)

Tris Buffer	750 mmol/L
EGTA	60 µmol/L
Xylidyl blue	110 µmol/L
Detergents	< 2 %

Reagent (R2)

Standard (Magnesium)	value on label

REAGENT PREPARATION AND STABILITY

Liquid and ready to use reagents, stable until the expiry date shown, if stored as indicated on the label and avoid contamination, evaporation and prolonged exposure to direct light.

Do not freeze the reagents.

Discard the reagent if signs of deterioration appear, such as the presence of particles and turbidity or failure to recover the values of certified control sera or Blank Absorbance (Abs) at 510 nm >1.0.

After opening the bottles, it is advisable to withdraw the necessary volume, to immediately close the bottles and store them in the fridge in order to avoid contamination, degradation from direct light and evaporation.

SPECIMEN

Serum, heparinised plasma, cerebrospinal fluid (CSF) or 24 hours urine.

Do not use EDTA plasma. Avoid hemolysate or lipemic samples.

Separate the serum from the clot quickly.

Collect 24-hours urine adding 10 mL of HCl at pH 3-4, then dilute the sample 1:5 (1+4) with distilled water.

Stability:

In serum /plasma: 7 days at 4°- 25°C ; 1 year at -20°C

In urine: 3 days at 4°- 25°C; 1 year at -20°C

Discard contaminated specimens.

PROCEDURE

Wavelength:	510 nm (500-550)
Temperature:	37°C
Measurement:	against distilled water

Pipette as follow

Reagent R1	1000 µL
Sample, Std / Cal, H_2O	10 µL

Mix and after 5 minutes read Absorbance of Blank, Calibrator/Standard and Samples within 60 minutes.

CALCULATION

Serum, Plasma, CSF

$$\text{Magnesium} = \frac{\text{Abs Sample} - \text{Abs Blank Reagent}}{\text{Abs Std/Cal} - \text{Abs Blank Reagent}} \times \text{Concentration Std/Cal}$$

Urine:

Calculate as for the serum/plasma/CFS and multiply the result by 5 (initial sample dilution).

Magnesium (mg/24h) = Urinary Magnesium (mg/dL) x Urine Volume 24h (dL)

Magnesium (mmol/24h) = Urinary Magnesium (mmol/L) x Urine Volume 24h (L)

Conversion Factor: Magnesium [mg/dL] x 0.4114 = [mmol/L]

CALIBRATION WITH STANDARD OR CALIBRATOR

The results depend on the accuracy of the calibration, on the correct setting of the test on the instrument, on the correct volumetric ratio of reagent / sample and on the correct analysis temperature.

As an alternative to the standard included in the package, it is possible to use **MTD Diagnostics Calibrator:**

Chemistry Multicalibrator REF CAL1010 (10 x 3 mL)

QUALITY CONTROL

Normal and abnormal control sera of known concentration should be analysed routinely with each group of unknown samples utilizing **MTD Diagnostics** Quality Control Material:

Chemistry Control N - REF CNN1010 10 x 5 mL (Level 1)

Chemistry Control P - REF CNP1020 10 x 5 mL (Level 2)

EXPECTED VALUES

Serum / Plasma:

Neonates	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
24h Urine:	73 - 122 mg/24 h	3 – 5 mmol/24 h
CSF:	2.1 - 3.3 mg/dL	0.85 – 1.35 mmol/L

Each laboratory should establish a range of expected values based on its patient population and, if necessary, determine its own reference interval. For diagnostic purposes, results should always be assessed together with the patient's medical history, clinical examination and other results.

PERFORMANCE

PRECISION:
Low Level: Samples= 20; Average = 1.88; S.D. = 0.02; CV = 0.92%
High Level: Samples = 20; Average = 4.02; S.D. = 0.03; CV = 0.83%

ACCURACY (CORRELATION): A comparison between this method (x) and a certified method of trade (y) gave the following correlation:

y=1.01x-20.03 ; r=0.999

SENSITIVITY: 0.05 mg/dL

LINEARITY: 0.05 – 18.0 mg/dL

SPECIFICITY / INTERFERENCES

No interference was observed by Ascorbic Acid up to 30 mg/dL, Bilirubin up to 40 mg/dL, Lipemia up to 2000 mg/dL Triglycerides and Calcium up to 25 mg/dL. Haemoglobin interferes because magnesium is released by erythrocytes.

NOTES

1. It is recommended use disposable material to avoid magnesium contamination. If glassware is used the material should be scrupulously clean with H_2SO_4 - $K_2Cr_2O_7$ and then thoroughly rinsed with distilled water and dried before use.
2. This method may be used with different instruments. Any application to an instrument should be validated to demonstrate that results meet the performance characteristics of the method. It is recommended to validate periodically the instrument. Contact your distributor for any question on the application method.
3. Clinical diagnosis should not be made on findings of a single test result, but should integrate both clinical and laboratory data.

PRECAUTIONS

R1 contain TRIS BUFFER - CAS 1185-53-1
R36-37-38 (H319 – H335 – H315): Irritating to eyes, respiratory system and skin

The product does not contain any other hazardous substances or mixtures according to EC Regulation No. 1272/2008 (CLP) or their concentrations are such that they are not considered to be persistent, bioaccumulative or toxic (PBT). Therefore, it is not subject to the special labeling required by the aforementioned regulation. The product is labeled according to the directive for CE marking (98/79 / EC). Sodium Azide less than 0.1%.
However, in compliance with the normal prudential rules that everyone has to keep managing any chemical or laboratory reagent, in case of contact of reagents with the operator, you must apply the following first aid:
S26 (P305 – P351 – P338): In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S28 (P302 – P352): After contact with skin, wash immediately with plenty of water.
S36/37/39 (P280): Wear suitable protective clothing, gloves and eye/face protection.
S46 (P301 – P310): If swallowed, seek medical advice immediately and show container or label. If victim is conscious and alert, wash out mouth with water.
S56 (P273): Dispose of this material and its container at hazardous or special waste collection point.
S63 (P304 – P340): In case of accident by inhalation: remove casualty to fresh air and keep at rest. If breathing is difficult, give oxygen and get medical aid.

All samples, calibrators and controls should be treated as potentially infectious material capable of transmitting HIV and hepatitis.

FOR MORE INFORMATION, REQUEST SAFETY DATA SHEET FOR REAGENT (MSDS) AT THE MANUFACTURER.

CE	CE Mark (EC Directive 98/79)		
IVD	In Vitro Diagnostic		Temperature Limitation
	Consult instructions for use		Contains sufficient for <n> test
REF	Catalog Number		Use By
LOT	Batch Code		Manufacturer

SIMBOLOGY

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