OBio...
Supporting Care to Cure
A Division of Orchard Medical

Magnesium

IVD

Order Information

Cat. No.	Kit Configuration
OAR1133	Reagent: 2 x 20 mL Standard: 1 x 2 mL

Summary

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, arrhythmia). 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.

Method

Photometric test using xylidyl blue.

Principle

Magnesium forms a coloured complex when reacts with Magon sulfonate in alkaline solution. The intensity of the color formed is proportional to the magnesium concentration in the sample

Reagent Storage Instructions and Stability

The reagent is stable till the date of expiry, if stored at 2° - 8°C, protected from light and contamination is avoided.
Do not freeze the reagents.
Note:Measurement is not influenced by occasionally occurring color changes.

Composition

Reagent: Xylidyl Blue-0.1mmol/l, Thioglycolic acid-0.7mmol/l, DMSO-3000 mmol/l
Standard: Magnesium aqueous standard 2 mg/dL.

Warnings and Precautions

1. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
2. Wear suitable gloves and eye/face protection.
3. Always use safety pipettes to pull the reagents into a pipette.
4. Reagents may contain some non-reactive and preservative components. It is suggested to handle carefully, avoid direct contact with skin and do not swallow.
5. The reagents contain sodium azide (0.95 g/L) as preservative. Do not swallow. Avoid contact with skin and mucous membranes.
6. For professional use only!

Waste Management

Please refer to local legal requirements.

Reagent Preparation

The reagent and the standard are ready to use.

Materials required but not provided

NaCl solution 9 g/L
General laboratory equipment

Specimen

Serum, heparin plasma or EDTA plasma
Stability, 1 month at 2° – 8 °C,
3 months at -
20°C Only
freeze once
Urine: Should be acidified to pH 1 with HCl. If urine is cloudy; warm the specimen to 60°C for 10 min. to dissolve precipitates. Dilute the sample 1/10 with distilled water and multiply the result by 10.
Stability: 3 days at 2-8°C and 1 month at
-20°C. Discard contaminated specimens.

Assay Procedure

Wavelength	546 nm
Light path	10 mm
Temperature	37°C
Measurement	against Reagent Blank

	Blank	Sample/Standard/Calibrator
Reagent	1000 µL	1000 µL
Distilled water	10 µL	-
Sample/Standard	-	10 µL
Mix, incubate for 3 min. at 37°C. Read absorbance against the Reagent blank.		

Calculation:

With Standard or Calibrator

$$\text{Magnesium (mg/dL)} = \frac{\Delta A \text{ Sample}}{\Delta A \text{ Std. /Cal}} \times \text{Conc. of Std. /Cal (mg/dL)}$$

Conversion Factor

Magnesium (mg/dL) x 0.4114 = Magnesium (mmol/L)

Quality Control

For internal quality normal and abnormal controls should be assayed with each batch of samples.
Each laboratory should establish corrective action in case of deviations in control recovery.

Performance Characteristics and Measuring Range

Measuring range of the assay is 0.5 to 6 mg/dL. When values exceed 6 mg/dL, the samples should be diluted 1+4 NaCl solution (9 g/L) and there multiplied by 5.

Specificity/Interferences

Hemolyzed, grossly icteric or lipemic specimens are unsuitable for this method.

Sensitivity/Limit of Detection

The lower limit of detection is 0.5 mg/dL.

Linearity

The higher limit of detection is 6 mg/dL.

Precision

Intra assay n = 20	Mean [mg/dL]	SD [mg/dL]	CV [%]
Sample 1	3.27	0.11	3.48
Sample 2	6.39	0.20	3.12

Inter assay n = 20	Mean [mg/dL]	SD [mg/dL]	CV [%]
Sample 1	1.65	0.10	6.06
Sample 2	7.17	0.23	3.16

Method Comparison

A comparison of Nucleus Diagnosys Magnesium (y) with a commercially available test (x) using 15 samples gave following results:
$y = 1.023x - 0.098$; $r^2 = 0.970$.

Reference Range

Serum or plasma: 1.6 –2.5 mg/dL, 0.66 –1.03 mmol/L
Urine: 24 –244 mg/24 h, 2 –21 mEq/L/24 h

Each laboratory should check if reference ranges are transferable to its own patient population and determine own reference ranges if necessary.

Literature

1. Tietz Textbook of Clinical Chemistry. 3rd ed. Philadelphia: W.B Saunders Company; 1999.p.809-61
2. Eur Heart J 1998: 19 1434-503.
3. Handbook of lipoprotein testing. Washington: ACC Press, 1997:99-114.
4. Handbook of lipoprotein testing. Washington: AACC Press, 1997:25 -48.

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