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CE CORMAY

Liquick Cor - MG

Kit name	**(EN) Cat. No**
Liquick Cor-MG mini	3-246
Liquick Cor-MG 30	3-228
Liquick Cor-MG 60	3-229
Liquick Cor-MG 500	3-322

INTENDED USE

Diagnostic kit for determination of magnesium concentration, may be used both for manual assay and in several automatic analysers. The reagents must be used only for *in vitro* diagnostic, by suitably qualified laboratory personnel, only for the intended purpose, under appropriate laboratory conditions.

INTRODUCTION

Magnesium in human organism occurs mainly in bone (about 50%) but is present also intracellularly in other tissues. Magnesium serves as a cofactor for multiple enzymatic reactions involved in nucleic acids synthesis, transport and production of energy. Magnesium is important in neuromuscular conduction and activation. Reduced magnesium level generates: concentration disturbances, fatigue, muscle tremor, anxiety state.

METHOD PRINCIPLE

Magnesium forms a purple coloured complex in alkaline solution. In the presence of EGTA, the reaction is specific. The intensity of the purple colour is proportional to the magnesium concentration.

REAGENTS

Package

	Liquick Cor-MG mini	**Liquick Cor-MG 30**
1-MG	2 x 30 ml	6 x 30 ml
2-STANDARD	1 x 1 ml	1 x 2 ml

	Liquick Cor-MG 60	**Liquick Cor-MG 500**
1-MG	6 x 60 ml	4 x 500 ml
2-STANDARD	-	-

2-STANDARD is magnesium ions standard solution: 0.82 mmol/l (2.0 mg/dl).

The reagent is stable up to the kit expiry date printed on the package when stored at 2-8°C. On board stability of the reagent depends on type of analyser used for analysis..

Concentrations in the test

xylidyl blue	≤ 0.18 mmol/l
EGTA	≤ 0.12 mmol/l
CAPS	≤ 0.06 mol/l
potassium hydroxide	≤ 0.07 mol/l
buffer (pH 11.5)	≤ 0.14 mol/l
detergent	
preservative	

Warnings and notes

- Protect from direct sunlight and avoid contamination!
- The reagent is air sensitive, to extend reagents stability it is recommended to keep reagent's bottles recapped on the board of analyser.
- It is recommended to use disposable plastic materials. If it is not possible, reusable reaction cuvettes should be washed with 1% HCl solution and rinsed with plenty of distilled water
- Please refer to the MSDS for detailed information concerning safe storage and use of the product.
- 1-MG meeting the criteria for classification in accordance with Regulation (EC) No 1272/2008.

Ingredients:
1-MG contains potassium hydroxide.

Danger

H314 Causes severe skin burns and eye damage.
P280 Wear protective gloves/protective clothing/eye protection/face protection.
P301+P330+P331 IF SWALLOWED: rinse mouth. Do NOT induce vomiting.
P303+P361+P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water.
P305 +P351 +P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P310 Immediately call a POISON CENTER or doctor.

ADDITIONAL EQUIPMENT

- automatic analyzer or photometer able to read at 520 nm;
- thermostat at 37ºC;
- general laboratory equipment;

SPECIMEN [6, 7]

Serum, heparinized plasma free from hemolysis, 24-hours urine.
Recommended anticoagulants: heparine lithium, sodium or ammonium salt.
Serum should be separated from red blood cells as soon as possible after blood collection, because erythrocytes contain approximately 3 times the magnesium concentration found in normal serum.
Urine preparation: acidify urine with some drops of concentrated hydrochloride acid to pH 1.0. Then dilute 1 part of acidified urine with 4 parts of distilled water. Multiply the result by 5. Mix well samples before analysis.
Serum and plasma can be stored up to 7 days at 2-8ºC. For longer storage samples should be frozen at -20ºC.
24-hours urine samples can be stored up to 7 days at 2-8ºC. Nevertheless it is recommended to perform the assay with freshly collected samples!

PROCEDURE

The reagent is ready to use. Avoid foaming.
Applications for analysers are available on request.

Manual procedure

wavelength	520 nm
temperature	37°C
cuvette	1 cm

Pipette into the cuvette:

	blank (B)	test (T)	standard (S)
1-MG	1000 µl	1000 µl	1000 µl

Bring up to the temperature of determination (about 10 min.). Then add:

standard / calibrator	-	-	10 µl
sample	-	10 µl	-
distilled water	10 µl	-	-

Mix well, after 5 minutes of incubation read the absorbance of standard A(S) and test A(T) against blank(B).

Calculation

$$\text{magnesium concentration} = \frac{A(T)}{A(S)} \times \text{standard / calibrator concentration}$$

REFERENCE VALUES [6]

serum / plasma		mg/dl	mmol/l
newborn	2 – 4 d	1.5 – 2.2	0.62 – 0.91
children	5 mo – 6 y	1.7 – 2.3	0.70 – 0.95
	6 – 12 y	1.7 – 2.1	0.70 – 0.86
	12 – 20 y	1.7 – 2.2	0.70 – 0.91
adults		1.6 – 2.6	0.66 – 1.07
24-hours urine		mg/24h	mmol/24h
		72.9 – 145.8	3-5

It is recommended for each laboratory to establish its own reference ranges for local population.

QUALITY CONTROL

For internal quality control it is recommended to use with each batch of samples, the CORMAY SERUM HN (Cat. No 5-172) and CORMAY SERUM HP (Cat. No 5-173) for determination in serum, CORMAY URINE CONTROL LEVEL 1 (Cat. No 5-161) and LEVEL 2 (Cat. No 5-162) for determination in urine.
For the calibration of manual assay the CORMAY MULTICALIBRATOR LEVEL 1 (Cat. No 5-174; 5-176), LEVEL 2 (Cat. No 5-175; 5-177) or MG STANDARD (Cat. No 5-127) is recommended.
For the calibration of automatic analysers systems the CORMAY MULTICALIBRATOR LEVEL 1 (Cat. No 5-174; 5-176) and LEVEL 2 (Cat. No 5-175; 5-177) is recommended.
Calibration stability depends on type of analyser used for analysis. The calibration curve should be prepared with change of reagent lot number or as required e.g. quality control findings outside the specified range.

PERFORMANCE CHARACTERISTICS

The following results have been obtained using an automatic analyser Biolis 24i Premium. Results may vary if a different instrument or a manual procedure is used.

- **Sensitivity:** 0.06 mg/dl (0.025 mmol/l).
- **Linearity:** up to 5.0 mg/dl (2.05 mmol/l).
- **Specificity / Interferences**

Haemoglobin up to 0.313 g/dl, ascorbate up to 62 mg/l, bilirubin up to 15 mg/dl, triglycerides up to 1000 mg/dl and calcium up to 20 mg/dl do not interfere with the test.

- **Precision**

Repeatability (run to run) n = 10	Mean [mg/dl]	SD [mg/dl]	CV [%]
level 1	2.05	0.02	1.07
level 2	4.21	0.04	0.93
Reproducibility (day to day) n = 20	Mean [mg/dl]	SD [mg/dl]	CV [%]
level 1	1.97	0.04	2.12
level 2	4.16	0.07	1.76

- **Method comparison**

A comparison between magnesium values determined at **Biolis 24i Premium** (y) and at **ADVIA 1650** (x) using 119 samples gave following results:
y = 0.9195 x + 0.036 mg/dl;
R = 0.980 (R – correlation coefficient)

TRACEABILITY

MG STANDARD is traceable to the SRM 956C reference material.

WASTE MANAGEMENT

Please refer to local legal requirements.

LITERATURE

1. C.K., Mann, J.H., Yoe, Anal. Chem. 28 (2), 202-205 (1956).
2. C. Bohuon, Clin. Chim. Acta 7, 811-817 (1962).
3. C.A, Burtis, E.R. Ashwood, eds. Tietz Fundamentals of Chemical Clinical Chemistry 4th ed. W.B. Saunders, 690-691, (1996).
4. J. Pesce, L.A. Kaplan, ed., Methods in Clinical Chemistry, Mosby, 1021-1026 (1987).
5. W.R. Faulkner, S. Meites, ed. Selected Methods for the Small Clinical Laboratory, AACC Press, 277-281 (1982).
6. C.A. Burtis, E.R. Ashwood, ed. Tietz Textbook of Clinical Chemistry, 3rd ed. Philadelphia, PA: Moss D. W., Henderson A. R. 1825 (1999).
7. Regulation of the Minister of Health of 15 December 2017 amending the regulation on quality standards for medical diagnostic and microbiological laboratories

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