

# Liquick Cor-MG

## DIAGNOSTIC KIT FOR DETERMINATION OF MAGNESIUM CONCENTRATION



<b>Kit name</b>	<b>Cat. No</b>
Liquick Cor-MG 500	3-322
Liquick Cor-MG "bulk"	3-291

### 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

	<b>Liquick Cor-MG 500</b>	<b>Liquick Cor-MG "bulk"</b>
1-MG	4 x 500 ml	--*

\*reagent volume is printed on the label.

### Reagent preparation and stability

The reagent is ready to use.

Avoid foaming.

The reagent is stable up to the kit expiry date printed on the package when stored at 2-8°C. The reagents in open bottles are stable for 8 weeks on board the analyser at 2-10°C. To extend reagents stability it is recommended to keep reagents bottles recapped on the board of analyser. Protect from light, avoid contamination!

### Concentrations in the test

xylydyl blue	0.2 mmol/l
EGTA	0.1 mmol/l
ethanolamine	0.75 mol/l
detergent	

### Warnings and notes

- Product for in vitro diagnostic use only.
- The reagents contain sodium azide < 0.1% as a preservative. Avoid contact with skin and mucous membranes.
- It is recommended to use disposable plastic materials. If it is not possible, the glassware should be washed with 1% HCl solution and rinsed with plenty of distilled water.

### ADDITIONAL EQUIPMENT

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

### SPECIMEN

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 2-8°C. For longer storage samples should be frozen at -20°C.

24-hours urine samples can be stored up to 7 days at 2-8°C. Nevertheless it is recommended to perform the assay with freshly collected samples!

### PROCEDURE

These reagents may be used both for manual assay and in several automatic analysers. Applications for them 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. Then add:

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

Mix well, after 2 minutes incubation for 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 <sup>6</sup>

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
	7.32 – 12.2	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 the CORMAY SERUM HN (Cat. No 5-172) and CORMAY SERUM HP (Cat. No 5-173) for determination in serum or CORMAY URINE CONTROL LEVEL 1 (Cat. No 5-161) or LEVEL 2 (Cat. No 5-162) for determination in urine with each batch of samples.

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.

The calibration curve should be prepared every 8 weeks, with change of reagent lot number or as required e.g. quality control findings outside the specified range.

### PERFORMANCE CHARACTERISTICS

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

- Sensitivity:** 0.07 mg/dl (0.03 mmol/l).

- **Linearity:** up to 9 mg/dl (3.69 mmol/l).

- **Specificity / Interferences**

Haemoglobin up to 0.625 g/dl, ascorbate up to 62 mg/l, bilirubin up to 20 mg/dl, triglycerides up to 1000 mg/dl and calcium up to 22 mg/dl do not interfere with the test.

- **Precision**

Repeatability (run to run) n = 20	Mean [mg/dl]	SD [mg/dl]	CV [%]
level 1	2.10	0.02	0.92
level 2	4.47	0.05	1.02

Reproducibility (day to day) n = 80	Mean [mg/dl]	SD [mg/dl]	CV [%]
level 1	2.06	0.06	2.95
level 2	4.53	0.06	1.30

- **Method comparison**

A comparison between magnesium values determined at Biolis 24i Premium (y) and at ADVIA 1650 (x) using 101 samples gave following results:

$$y = 0.9925 x + 0.0111 \text{ mg/dl};$$

$$R = 0.9764 \quad (R - \text{correlation coefficient})$$

**TRACEABILITY**

MG STANDARD is traceable to the SRM 909B reference material.

**WASTE MANAGEMENT**

Please refer to local legal requirements.

**LITERATURE**

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**Date of issue:** 07. 2012.

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07/12/07/12