

Magnesium XL FS*

Diagnostic reagent for quantitative in vitro determination of magnesium in serum or plasma on DiaSys respons[®]910

Order Information

Cat. No. 1 4610 99 10 921
4 containers for 120 tests each

Method

Photometric test using xylydyl blue

Principle

Magnesium ions form a purple colored complex with xylydyl blue in alkaline solution. In presence of GEDTA, which complexes calcium ions, the reaction is specific. The intensity of the purple color is proportional to the magnesium concentration.

Reagents

Components and Concentrations

Ethanolamine	pH 11.0	750 mmol/L
GEDTA (Glycoetherdiamine tetraacetic acid)		60 µmol/L
Xylydyl blue		110 µmol/L

Storage Instructions and Reagent Stability

The reagent is stable up to the end of the indicated month of expiry, if stored at 2 – 8°C and contamination is avoided. Do not freeze the reagent!

Warnings and Precautions

1. Reagent: Danger. H315 Causes skin irritation. H318 Causes serious eye damage. P264 Wash hands and face thoroughly after handling. P280 Wear protective gloves/protective clothing/eye protection. 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/physician.
2. In very rare cases, samples of patients with gammopathy might give falsified results [8].
3. Please refer to the safety data sheets and take the necessary precautions for the use of laboratory reagents. For diagnostic purposes, the results should always be assessed with the patient's medical history, clinical examinations and other findings.
4. For professional use only!

Waste Management

Please refer to local legal requirements.

Reagent Preparation

The reagent is ready to use. The bottles are placed directly into the reagent rotor.

Specimen

Serum or plasma (do not use EDTA plasma!)

Stability [1]:

7 days	at	20 – 25°C
7 days	at	4 – 8°C
1 year	at	-20°C

Discard contaminated specimens. Freeze only once

Calibrators and Controls

For calibration, DiaSys TruCal U calibrator is recommended. The assigned values of the calibrator have been made traceable to the reference method Atomic Absorption Spectrometry (AAS). For internal quality control DiaSys TruLab N and P controls should be assayed. Each laboratory should establish corrective action in case of deviations in control recovery.

	Cat. No.	Kit size
TruCal U	5 9100 99 10 063	20 x 3 mL
	5 9100 99 10 064	6 x 3 mL
TruLab N	5 9000 99 10 062	20 x 5 mL
	5 9000 99 10 061	6 x 5 mL
TruLab P	5 9050 99 10 062	20 x 5 mL
	5 9050 99 10 061	6 x 5 mL

Performance Characteristics

Measuring range up to 5 mg/dL magnesium (in case of higher concentrations re-measure samples after manual dilution with NaCl solution (9 g/L) or use rerun function).	
Limit of detection**	0.2 mg/dL magnesium
On-board stability	10 days
Calibration stability	7 days

Interfering substance	Interferences < 10%	Magnesium [mg/dL]
Ascorbate	up to 30 mg/dL	3.39
Hemoglobin	up to 250 mg/dL	1.90
Bilirubin, conjugated	up to 250 mg/dL	2.90
	up to 50 mg/dL	2.04
Bilirubin, unconjugated	up to 60 mg/dL	2.08
	up to 60 mg/dL	2.99
Lipemia (triglycerides)	up to 1300 mg/dL	1.99
	up to 1800 mg/dL	2.78
Calcium	up to 20 mg/dL	2.08

Hemolysis interferes because Magnesium is released by erythrocytes [3].
For further information on interfering substances refer to Young DS [2].

Precision			
Within run (n=20)	Sample 1	Sample 2	Sample 3
Mean [mg/dL]	2.20	3.77	4.73
Coefficient of variance [%]	2.41	2.36	1.68
Between run (n=20)	Sample 1	Sample 2	Sample 3
Mean [mg/dL]	1.96	2.40	4.84
Coefficient of variance [%]	3.01	2.46	1.75

Method comparison (n=113)	
Test x	DiaSys Magnesium XL FS (Hitachi 917)
Test y	DiaSys Magnesium XL FS (respons [®] 910)
Slope	1.06
Intercept	-0.099 mg/dL
Coefficient of correlation	0.991

** according to NCCLS document EP17-A, vol. 24, no. 34

Conversion factor

Magnesium [mg/dL] x 0.4114 = Magnesium [mmol/L]

Reference Range [3]

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)

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

Literature

1. Guder WG, Zatwa B et al. The quality of Diagnostic Samples. 1st ed. Darmstadt: Git Verlag, 2001: 38-39.
2. Young DS. Effects of Drugs on Clinical Laboratory Tests. 5th. ed. Volume 1 and 2. Washington, DC: The American Association for Clinical Chemistry Press, 2000.
3. Thomas L. Clinical Laboratory Diagnostics. 1st ed. Frankfurt: TH-Books Verlagsgesellschaft, 1998. p. 339-40.
4. Sitzmann FC. Normalwerte. München: Hans Marseille Verlag GmbH: 1986. p. 166.
5. Endres DB, Rude RK. Mineral and bone metabolism. In: Burtis CA, Ashwood ER, editors. Tietz Textbook of Clinical Chemistry. 3rd ed. Philadelphia: W.B Saunders Company; 1999. p. 1395-1457.
6. Mann CK, Yoe JH. Spectrophotometric determination of magnesium with 1-Azo-2-hydroxy-3-(2,4-dimethylcarboxanilido)-naphthalene-1'-(2-hydroxybenzene). Anal Chim Acta 1957; 16 : 155-60.
7. Bohoun C. Microdosage du magnésium dans divers milieux biologiques. Clin Chim Acta 1962; 7: 811-7.
8. Bakker AJ, Mücke M. Gammopathy interference in clinical chemistry assays: Mechanisms, detection and prevention. Clin Chem Lab Med 2007; 45(9): 1240–1243.

Manufacturer



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Magnesium XL FS

Application for serum and plasma samples

This application was set up and evaluated by DiaSys. It is based on the standard equipment at that time and does not apply to any equipment modifications undertaken by unqualified personnel.

Identification	
This method is usable for analysis:	Yes
Twin reaction:	No
Name:	MG
Shortcut:	
Reagent barcode reference:	047
Host reference:	047

Technic	
Type:	End point
First reagent:[μ L]	180
Blank reagent	Yes
Sensitive to light	
Second reagent:[μ L]	
Blank reagent	
Sensitive to light	
Main wavelength:[nm]	546
Secondary wavelength:[nm]	700
Polychromatic factor:	1.0000
1 st reading time [min:sec]	(-00:12)
Last reading time [min:sec]	06:00
Reaction way:	Increasing
Linear Kinetics	
Substrate depletion: Absorbance limit	
Linearity: Maximum deviation [%]	
Fixed Time Kinetics	
Substrate depletion: Absorbance limit	
Endpoint	
Stability: Largest remaining slope	
Prozone Limit [%]	

Reagents	
Decimals	
Units	

Sample	
Diluent	DIL A (NaCl)
Hemolysis:	
Agent [μ L]	0 (no hemolysis)
Cleaner	
Sample [μ L]	0
Technical limits	
Concentration technical limits-Lower	0.2000
Concentration technical limits-Upper	5.0000
SERUM	
Normal volume [μ L]	2.0
Normal dilution (factor)	1
Below normal volume [μ L]	
Below normal dilution (factor)	
Above normal volume [μ L]	2.0
Above normal dilution (factor)	6
URINE	
Normal volume [μ L]	2.0
Normal dilution (factor)	1
Below normal volume [μ L]	
Below normal dilution (factor)	
Above normal volume [μ L]	2.0
Above normal dilution (factor)	6
PLASMA	
Normal volume [μ L]	2.0
Normal dilution (factor)	1
Below normal volume [μ L]	
Below normal dilution (factor)	
Above normal volume [μ L]	2.0
Above normal dilution (factor)	6
CSF	
Normal volume [μ L]	2.0
Normal dilution (factor)	1
Below normal volume [μ L]	
Below normal dilution (factor)	
Above normal volume [μ L]	2.0
Above normal dilution (factor)	6
Whole blood	
Normal volume [μ L]	2.0
Normal dilution (factor)	1
Below normal volume [μ L]	
Below normal dilution (factor)	
Above normal volume [μ L]	2.0
Above normal dilution (factor)	6

Results	
Decimals	2
Units	mg/dL
Correlation factor-Offset	0.0000
Correlation factor-Slope	1.0000

Range	
Gender	Male
Age	
SERUM	$\geq 1.80 \leq 2.60$
URINE	
PLASMA	$\geq 1.80 \leq 2.60$
CSF	
Whole blood	
Gender	Female
Age	
SERUM	$\geq 1.90 \leq 2.50$
URINE	
PLASMA	$\geq 1.90 \leq 2.50$
CSF	
Whole blood	

Contaminants	
Please refer to r910 Carryover Pair Table	

Calibrators details	
Calibrator list	Concentration
Cal. 1/Blank	0
Cal. 2	*
Cal. 3	
Cal. 4	
Cal. 5	
Cal. 6	
	Max delta abs.
Cal. 1	0.003
Cal. 2	0.010
Cal. 3	
Cal. 4	
Cal. 5	
Cal. 6	
Drift limit [%]	0.80

Calculations	
Model	X
Degree	1

* Enter calibrator value