LiquiMAX MAGNESIUM - SLR
(XYLIDYL BLUE METHOD)

ORDERING INFORMATION

Ref. No.	Pack Size	Presentation
AVMAG - 25	25 x 1 ml	Single Liquid Reagent
AVMAG - 50	2 x 25 ml	

INTENDED USE
LiquiMAX MAGNESIUM is an in-vitro diagnostic kit for the quantitative determination of magnesium in human serum, and urine. This kit is a automated.

INTENDED USER
Laboratory Technician

PRODUCT FEATURES :

1. Single Liquid Reagent. Available in mono test packs.
2. Overcomes calcium, heavy metals and protein interferences.
3. Results correlate with Atomic Absorption.
4. Linearity 5 mg/dl.
5. 10 minutes End Point assay.
6. With Lipid Clearing Factor (LCF)
7. Can be used on any colorimeter, spectrophotometer, discrete semi automated and automated analyzers.

CLINICAL SIGNIFICANCE : Magnesium along with potassium is a major intracellular cation. Mg2+ is a cofactor of many enzyme systems. Thus, all ATP-dependent enzymatic reactions require Mg2+ as a cofactor in the ATP-magnesium complex. Approximately 69% of magnesium ions are stored in bone. The rest are part of the intermediary metabolism about 70% being present in free form while the other 30% is bound to proteins (especially albumin), citrates, phosphate, and other complex formers. The Mg2+ serum level is kept constant within very narrow limits (0.65-1.05 mmol/l). Regulation takes place mainly via the kidneys, especially via the ascending loop of Henle. This assay is used for diagnosing and monitoring hypomagnesemia (magnesium deficiency) and hypermagnesemia (magnesium excess). Numerous studies have shown a correlation between magnesium deficiency and changes in calcium-, potassium- and phosphate homeostasis which are associated with cardiac disorders such as ventricular arrhythmias that cannot be treated by conventional therapy, increased sensitivity to digoxin coronary artery spasms, and sudden death. Additional concurrent symptoms include neuromuscular and neuropsychiatric disorders. Hypermagnesemia is found in acute and chronic renal failure, magnesium excess, and magnesium release from the intracellular space. in addition to atomic absorption spectrometry (AAS), complexometric methods can also be used to determine magnesium. The method described here is based on the reaction of magnesium with xylidyl blue in alkaline solution containing EGTA to mask the calcium in the sample.

PRINCIPLES:
Xylidyl Blue Magnesium Ion forms a blue violet complex whose colour intensity is proportional to the Magnesium concentration in specimen and can be used for the photometric determination.

STORAGE AND STABILITY:
Reagent is ready for use and is stable up to the expiry date mentioned on the labels.Reagent must not be exposed to direct sunlight.

KIT COMPONENTS
1. Magnesium Reagent
2. Magnesium Standard : Concentration as stated on the label

COMPOSITION:

Tris buffer pH 11.0	250 mmol/l
Xylidyl Blue	1 mmol/l
Detergent	15 g/l
Magnesium Standard	2.00 mg/dl (Equivalent)

REAGENT RECONSTITUTION & STABILITY
Reagent are liquid stable no need for reconstitution.
When the reagent is stored properly at 2-8°C & the contamination avoided, it is stable up to the expiry date mention on the label & kit box.

MATERIAL REQUIRED BUT NOT PROVIDED
Laboratory Instrumentation, Spectrophotometer UV/VIS with thermostatic cuvette holder or clinical chemistry analyzer: semi auto, calibrated micropipettes, glass or high quality polystyrene cuvettes, test tube/rack, heating bath controls, saline.

REAGENT DETERIORATION
Discard any turbid reagent if blank reagent absorbance exceeds 1.6 at 546 nm against distilled water.

WARNING & PRECAUTIONS

- Reagent may contain some non reactive and preservative components. It is recommended to handle carefully, avoiding contact with skin and ingestion.
- Specimen should be considered infectious and handled appropriately.
- Contamination by soap or glycerol will affect this assay.
- Perform the test according to the general " Good Laboratory Practice" GLP

SPECIMEN COLLECTION & STORAGE
Fresh Serum is the prefered Specimen. Hemolyzed specimens are unacceptable.(Hemolysis interferes due to magnesium released from erythrocytes)

Urine
Collect urine sample in a metal-free container with no preservative. Acidify to approximately pH 3-4 prior to assay. Urine samples are manually diluted with distilled/ deionized water (1:5). Multiply the result by the appropriate dilution factor 5. Centrifuge samples containing precipitates before performing the assay.

SYSTEM PARAMETERS

Reaction type	:	END POINT
Wave length	:	546 nm (505-546)
Flow cell Temp.	:	37°C
Sample volume	:	10µl
Reagent volume	:	1000µl
Standard concentration	:	2
Units	:	mg/dl
Blanking with	:	Reagent
Low normal	:	1.59
High normal	:	2.6
Linearity	:	5

TEST PROCEDURE
LiquiMAX Magnesium - SLR is available as mono test pack. Reagent is pre dispensed as 1 ml into vials. Label the mono vials as Blank (B) Standard (S) and Test (T) as follows :

Reagent	Blank (B)	Standard (S)	Test (T)
Magnesium Reagent	1.0 ml	1.0 ml	1.0 ml
Magnesium Standard (Conc : 2 mg/dl)	-	10 µl	-
Specimen	-	-	10 µl

After adding the specimen/standard close the lid of the vial and mix well.
Incubate for 10 minutes at 37°C or 15 minutes at R.T.
Read absorbance of Standard (S) and Test (T) against Blank (B) at 546 nm (505-546).

Do not read the absorbance above 546 nm.

CALCULATIONS

$$\text{Serum Magnesium in mg/dl} = \frac{\text{Abs. of T}}{\text{Abs. of S}} \times 2$$

$$\text{Urine Magnesium in mg/dl} = \frac{\text{Abs. of T}}{\text{Abs. of S}} \times 2 \times 5$$

EXPECTED VALUES:

Serum	1.6 – 2.6 mg/dl
Cerebrospinal fluid	2.4 – 3.1 mg/dl
Urine	1 – 10 mg/dl
24 h Urine	350 – 200 mg/dl

Reference values according to Tietz

Serum:

Adults	:	1.59-2.56 mg/dl
2-4 days	:	1.46-2.20 mg/dl
5 months-6 years	:	1.71-2.29 mg/dl
6-12 years	:	1.71-2.07 mg/dl
12-20 years	:	1.59-2.20 mg/dl
Urine	:	12.2-292 mg/24 hours (Adults)

Each laboratory should investigate the transferability of the expected values to its own patient population and if necessary determine its own reference range. For diagnostic purposes, the magnesium results should always be assessed in conjunction with the patients medical history, clinical examinations and other findings.

QUALITY CONTROL & CALIBRATION

To ensure adequate quality control, the use of commercial reference control serum is recommended with each assay batch. Use of Quality Control material checks both, the instrument and the reagent functions.

PERFORMANCE CHARACTERISTICS

1. Linearity

The assay is linear up to the concentration of 5 mg/dl

2. Sensitivity/ Limit of Detection (LOD)

Detection limit: 0.09 mg/dl
The lower detection limit represents the lowest measurable magnesium concentration that can be distinguished from zero.

3. Interferences

No significant interference was observed from Bilirubin up to 10 mg/dl and Intralipid as triglycerides up to 950 mg/dl

4. Precision:

Intra-Assay (N=20)

Sample	Mean (mg/dl)	SD (mg/dl)	CV%
Level 1	2.39	0.02	1018
Level 2	4.01	0.07	1.73

Inter-Assay (N=20)

Sample	Mean (mg/dl)	SD (mg/dl)	CV%
Level 1	2.27	0.07	2.99
Level 2	4.14	0.13	3.20

5. Method Comparison:

A comparison of the LiquiMAX Magnesium - SLR (y) with a commercial obtainable assay (x) gave with samples the following result:

y= 0.903 x + 0.121; r = 0.986

LIMITATIONS

The test has been developed to determine Magnesium concentrations 0.09-5 mg/dl. When values exceed this range samples should be diluted 1 + 1 with NaCl solution (9 g/L) and the result should be multiplied by 2.

WASTE DISPOSAL

Reagents must be disposed off in accordance with local regulations.

References :

1. Bablok W. et al. A General Regression Procedure for Method Transformation. J Clin Chem Clin Biochem 198826:783-790.
2. Ehrhardt V., Appel W, Paschen K. et al. Evakuierung eines Xylidyl- Blau-Reagenz zur Bestimmung von Magnesium. Wien Klin Wschr 1992;104:5-11.
3. Ehrhardt V., Paschen K., Vogt W. et al. Magnesium-Bestimmung im Serum und Urin mit einer verbesserten Xylidyl-Blau-Methode. Workshop Kaiserslautern 1989, Workshop Report Magnesium.
4. Glick M.R., Ryder K.W., Jackson SA. Graphical Comparisons of Interferences in Clinical Chemistry Instrumentation. Clin Chem 1986;32:470-d74.
5. Guder W.G., Narayanan S., Wisser H., Zawta B., List of Analytes Preanalytical Variables. Broschüre in: Samples: From the Patient to the Laboratory. Darmstadt: GIT Verlag, 1996.2

Symbols Used on Pack

REF	Catalogue Number		Warning/Caution
LOT	Batch No.	IVD	In vitro diagnostic device
	Manufacturing Date		Storage Limit
	Expiry Date		Consult instruction for use
	Manufacturer		Keep away from sunlight
	Keep Dry		Do not use if package is damaged
	Contains sufficient no. of test		

Manufactured in India by :
Healthcare Pvt. Ltd.
Transforming Research into Innovations
Plot No.: 338, Sector-2, Industrial Growth Centre, Saha, Ambala, Haryana (INDIA)-133104
E-mail : helpdesk@aveconhealthcare.com, Website : www.aveconhealthcare.com
Customer Care No. : +91 93065 12576, CIN No.: U24230HR2006PTC118875

Ver. : 05/01-26