

## ABS\_Bio™ Magnesium Colorimetric Detection Kit (Cat# K332-200; 200 assays; store kit at 4°C)

### Introduction

Magnesium is one of the most abundant cations in the body involved in many biochemical reactions. It is an activator of various enzymes. It is also involved in amino acid activation and protein synthesis. Increased levels are found in dehydration, Addison's disease and uremia. Decreased levels are found in malabsorption, during treatment of diabetic coma, chronic renal disease, chronic alcoholism, pancreatitis and hyperthyroidism. Magnesium is also necessary for the stability of conformational structure for many macromolecules such as DNA, RNA, etc.

The ABS\_Bio™ Magnesium Colorimetric Detection Kit provides a simple, sensitive, one-step colorimetric assay to detect magnesium in various samples. In this assay, magnesium combines with Xylidyl Blue dye in an alkaline solution to form a red colored complex. The intensity of the color, measured at 520 nm, is directly proportional to the amount of magnesium in the sample. Interference of calcium and proteins is eliminated by the addition of specific chelating agents and surfactants. The kit is supplied with sufficient reagents for 200 tests in 96-well plate assay and has a linear detection range of 0.02-3 mg/dL (8-1200 µM). It could easily be modified for use in a 384-well or a high-throughput assay.

### Kit Components (200 tests)

Color Reagent: 30 mL                      Magnesium Standard (2 mg/dL): 1 mL

Storage and Handling: Store kit at 4°C.      Shelf Life: 12 months after receipt.      Warm up Reagents to room temperature before use.

### Protocol

#### 1. Sample preparation

Serum, Plasma (EDTA-plasma cannot be used, haemolysed specimens are unacceptable), other bodily fluids, or cell culture supernatant can be measured directly by a series of dilutions (2-5 fold) of the sample to ensure the readings are within the standard curve range. Urine sample should be acidified to a pH of 2-3 with 6N HCl and 5-fold diluted with dH<sub>2</sub>O prior to assay. Homogenize cell (2 x 10<sup>6</sup>) or tissue (20 mg) samples in 200 µL PBS. Milk sample should be mixed with equal volumes of 5% TCA solution, incubate 5 minute, then centrifuge to collect the supernatant for assay. Note: Sample pH should be between 2 to 8. It is recommended with all sample types to assay immediately or aliquot and store at -80°C. Transfer 5 µL of the sample into the 96-well clear flat bottom plate in duplicate.

#### 2. Standard Preparation

Transfer 5 µL of appropriate standards into the 96-well plate in duplicate. The blank control containing 5 µL of dH<sub>2</sub>O only.

#### 3. Reaction

Transfer 150 µL color reagent into each reaction well. Tap plate to mix well. Incubate 5 min. at room temperature.

#### 4. Measurement

Read the optical density at 520 nm (500-530 nm).

#### 5. Calculation

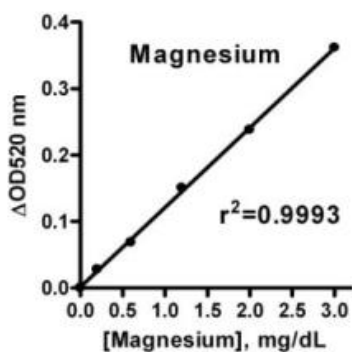
Calculate the magnesium concentration of the samples.

$$[\text{Magnesium}] = (\text{OD}_{\text{sample}} - \text{OD}_{\text{blank}}) / (\text{OD}_{\text{standard}} - \text{OD}_{\text{blank}}) \times 2 \times n \text{ (mg/dL)}$$

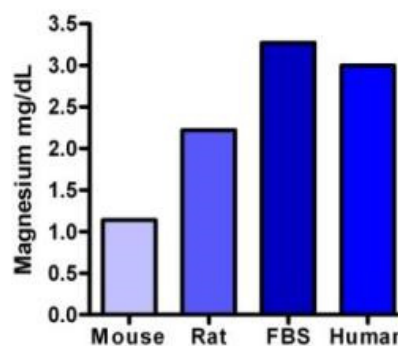
OD<sub>sample</sub>, OD<sub>standard</sub> and OD<sub>blank</sub> are the optical densities of the sample, standard and dH<sub>2</sub>O. 2 is the concentration of magnesium standard (2 mg/dL), *n* is the sample dilution factor.

**Conversions:** 1 mg/dL magnesium equals 411 µM.

#### Typical Standard Curve



Magnesium standard in 96 wells-plate assay.



Serum sample in 96 wells-plate assay.

### **Sensitivity and Limit of Detection**

The Limit of Detection was determined as 0.02 mg/dL (8 µM), with a linear detection range of up to 3 mg/dL (1200 µM) in the 96-well plate colorimetric assay. Sensitivity was determined as 0.015 mg/dL. Samples with values above 3 mg/dL should be diluted with dH<sub>2</sub>O, re-assayed, and multiplied by the dilution factor.

### **Interferences**

EDTA inhibits magnesium to chromogenic system. The test is not affected by presence of bilirubin up to 40 mg/dL, hemoglobin up to 0.2 g/dL.

### **References**

Ratge, D. et al. 1986. Clinica Chimica Acta. 159:197-203

Mann, CK. et al. 1956, Anal Chem 28: 202-206.

### **Related Products:**

Triglyceride Detection Kit (#K316-100)

ALP Fluorimetric Detection Kit (#K110-200)

NAD/NADH Detection Kit (#K120-100)

Creatinine Detection Kit (#K148-200)

Glucose Detection Kit (#K188-100)

Glutathione Detection Kit (#K140-100)

Glutathione Peroxidase Detection Kit (#K143-100)

Glutathione Reductase Detection Kit (#K146-100)

HRP Fluorimetric Detection Kit (#K210-100)

Xanthine Colorimetric Detection Kit (#K133-100)

ATP Detection Kit (#K135-100)

Acetate Detection Kit (#K308-100)

Ammonia Detection Kit (#K103-200)

Copper Colorimetric Detection Kit (#K330-200)

Zinc Colorimetric Detection Kit (#K333-200)

Heme Detection Kit (#K169-200)

Lactate Detection Kit (#K207-100)

NADP/NADPH Detection Kit (#K123-100)

Nitric Oxide Detection Kit (#K116-100)

Phosphatase Detection Kit (#K196-500)

Urea Detection Kit (#K158-200)

Choline Detection Kit (#K310-100)

TBARS Detection Kit (#K145-100)

Pyruvate Detection Kit (#K150-100)

Hemoglobin Detection Kit (#K168-200)

ADP Detection Kit (#K134-100)

Phosphate Detection Kit (#K198-500)

Sulfate Detection Kit (#K149-200)

Iron Colorimetric Detection Kit (#K329-200)

Calcium Colorimetric Detection Kit (#K301-200)