OBio...
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A Division of Orchard Medical

Calcium ARS

IVD

Order Information

Cat. No.	Kit Configuration
OMR1049	Reagent: 2 x 20 mL Standard: 1 x 2 mL

Summary

Approximately 99% of Calcium is mainly found in bones, whereas in serum it found in free ionized form (Ca^{2+}) or bound with Albumin. Thus increase or decrease of this protein causes increase or decrease of Calcium levels in blood respectively. Increased blood calcium may be observed in hyperparathyroidism, vitamin D intoxication, multiple myeloma and some neoplastic diseases of bone. Decreased serum calcium may be observed in hypoparathyroidism, vitamin D deficiency, steatorrhea, nephrosis, and nephritis.

Method

Arsenazo III method

Principle

Ca^{2+} forms a blue colored complex with arsenazo III and the intensity of the color formed is directly proportional to calcium concentration present in the sample.

Reagents Storage instructions and stability

The reagent is stable till the date of expiry, if stored at 2° - 8°C, protected from light and contamination is avoided. Do not freeze the reagent.
Reagent : Arsenazo
solution Standard :
Calcium (8 mg/dL)

Composition

Arsenazo 0.1 g/L, Immidazole 7 g/L, 8- Hydroxyquinoline 0.5 g/L. Standard: Calcium (Conc.: 8.0 mg/dL)

Warning and Precautions

1. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
2. Wear suitable gloves and eye/face protection.
3. Always use safety pipettes to pull the reagents into a pipette.
4. Reagents may contain some non-reactive and preservative components. It is suggested to handle carefully, avoid direct contact with skin and do not swallow.
5. For professional use only!

Waste Management

Please refer to local legal requirements

Reagent Preparation

Reagent is ready to use.

Materials required but not provided

NaCl solution 9 g/L
General laboratory equipment

Specimen

Serum, Heparin plasma or Urine
In Serum or Plasma may be stored for 10 days at 2-8°C & 8 months at - 20^0C.
In urine 4 days at 2-8^0C.
21 days at -20^0C
Add 10 mL of concentrated HCl to 24 h urine and heat the specimen to dissolve calcium oxalate.
Discard contaminated specimens. Freeze only once!

Assay Procedure

Wavelength	620 nm (610 – 630 nm)
Light path	10 mm
Temperature	20°- 30°C
Measurement blank	Against reagent

	Blank	Standard	Sample
Reagent	1000 µL	1000 µL	1000 µL
Standard	--------	20 µL	---------
Sample	--------	--------	20 µL
Mix, incubate for 2 min. at 20-30°C. Read absorbance against the reagent blank.			

Calculation

Calculation of the concentration "C" of calcium in the sample

$$C = 8.0 \times \frac{A\ sample}{A\ standard}\ (mg/dL)$$

Conversion factor

Calcium [mg/dL] x 0.2495 = Calcium [mmol/L]
Calcium/U [mg/24 h] x 0.025 = Calcium/U [mmol/24 h]

Quality Control

For internal quality control check with normal and abnormal controls should be assayed with each batch of samples. Each laboratory should establish corrective action in case of deviations in control recovery.

Performance characteristics Measuring Range

Measuring Range of assay is 0.25 mg/dL–15 mg/dL. If such value is exceeded the sample should be diluted 1+9 with NaCl solution (9g/L) and results multiplied by 10.

Interferences

No interference was observed by Bilirubin up to 40 mg/dL, Triglyceride up to 2000 mg/dL.

Sensitivity/Limit of Detection

The lower limit of detection is 0.25 mg/dL.

Linearity

The maximum limit of detection is 15 mg/dL.

Precision

Intra-assay n=20	Mean [mg/dL]	SD [mg/dL]	CV [%]
Sample 1	9.44	0.02	0.20
Sample 2	12.72	0.04	0.35

Inter-assay n=20	Mean [mg/dL]	SD [mg/dL]	CV [%]
Sample1	8.21	0.04	0.51
Sample 2	12.05	0.05	0.45

Method Comparison

A comparison of Nucleus Diagnosys Calcium ARS (y) with a commercially available test (x) using 15 samples gave following results:
$y = 0.994x + 0.017$; $r^2 = 0.989$

Reference Range

In Serum/Plasma – 8.1 - 10.4 mg/dL (2.02 - 2.6 mmol/L) In Urine –Woman < 250 mg/24h (6.24 mmol/24h)
–Men < 300 mg/24h (7.49 mmol/24h)

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

Literature

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