

BICARBONATE

Kinetic method

5 x 25 ml

CL07-125S

INTENDED USE

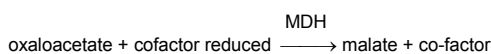
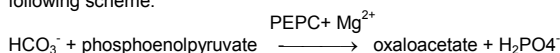
Quantitative determination of total carbon dioxide in serum and plasma.

CLINICAL MEANING

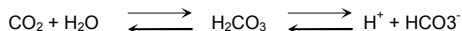
Carbon dioxide (CO₂) contained in plasma is made 90% by bicarbonate (HCO₃⁻). The measurement of total CO₂ as part of an electrolytic profile (Na⁺, K⁺, Cl⁻) is useful mainly to evaluate HCO₃⁻ concentration in presence of acid-basis disorders due to metabolic or respiratory dysfunctions.

PRINCIPLE

The enzymatic method used requires carbonic acid measurement as shown in the following scheme:



PEPC is specific for bicarbonate ion (HCO₃⁻) and its action interferes with the subsequent equilibrium inducing the conversion of CO₂ in HCO₃⁻:



So total carbon dioxide concentration in the sample is measured. The decrease of reduced co-factor concentration, measured spectrophotometrically at 405 or 415 nm, is proportional to total carbon dioxide concentration in the sample.

SAMPLE

Non hemolized serum or plasma treated with heparin as anticoagulant. The sample must be divided immediately from the clot / cells and analyzed as soon as possible after collection.

STABILITY: 1 day at 20-25°C, 7 days at 2-8°C; 2 weeks at -20°C.

NOTE: store the sample in an air-tight container to avoid loss of carbon dioxide.

REAGENTS

Only for in Vitro diagnostics. Liquid monoreagent ready to use.

| Package components: | CL07-125S |
|---|------------------|
| REAGENT Buffer pH 7.5, Phosphoenolpyruvate 12.5 mmol/L; Phosphoenolpyruvate carboxylase (PEPC) > 400 U/L; malate dehydrogenase (mdh) > 4100 U/L; NADH 0.6 mmol/L Activators, surfactants, stabilizers, preservatives. | 5 x 25 ml |
| STANDARD Values found on label | 1 x 4 ml |

STABILITY: stored at 2-8°C and kept away from the sun, reagents are stable up to the expiration date on the label.

NECESSARY ITEMS – NOT PROVIDED

Usual laboratory equipment: UV/VIS Spectrophotometer with temperature control; automatic micropipettes; Optical glass cuvettes or, alternatively, disposable ones in optical polystyrene; Saline solution.

MANUAL ASSAY PROCEDURE

| | |
|-----------------------|-----------------------|
| Wavelength: | 405 or 415 nm |
| Optical path: | 1 cm |
| Reading: | against blank reagent |
| Temperature: | 37°C |
| Reaction time: | 5 minutes |
| Linearity: | up to 50 mmol/L |
| Reagent/Sample Ratio: | 100/1 |

Let reagents and samples reach room temperature before use.

Pipette in cuvette or test tubes labeled as it follows:

| | Std | Sample |
|----------|---------|---------|
| Reagent | 1000 µl | 1000 µl |
| Standard | 10 µl | |

| | | |
|--------|--|-------|
| Sample | | 10 µl |
|--------|--|-------|

Mix accurately and incubate at 37°C. Read absorbance A1 exactly after 2 minutes, and absorbance A2 exactly after additional 5 minutes against blank reagent.

$\Delta A = (A2 - A1)$ sample or standard

CALCULATION

Carbon dioxide [mmol/L] = $(\Delta A_c / \Delta A_{st}) \times \text{standard conc. [mmol/L]}$

REFERENCE VALUES

22-29 mmol/L (22-29 meq/L)

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

QUALITY CONTROL – CALIBRATION

Each laboratory should implement a quality control program. In each analysis control serums should be used, both with normal and higher levels. The results must fall within the declared range.

To calibrate use the aqueous carbon dioxide standard found in the kit.

PERFORMANCES CHARACTERISTICS

CO₂ from air or the breath of the analyst is a major interference in this assay. Reagent handling, specimen collection and all storage instructions must be strictly followed to minimize this interference.

Sensitivity: the sensitivity of the method is about 2.0 mEq/L.

Linearity: up to 50 mmol/L (50 mEq/L).

For higher values, dilute samples with CO₂ free distilled water and multiply the result by the dilution factor.

Precision:

| Within run (n=10) | Average (mmol/L) | SD (mmol/L) | CV % |
|-------------------|------------------|-------------|------|
| Sample 1 | 10,3 | 0,5 | 1,8 |
| Sample 2 | 27 | 0,8 | 1,9 |

| Between run (n=20) | Average (mmol/L) | SD (mmol/L) | CV % |
|--------------------|------------------|-------------|------|
| Sample 1 | 10,3 | 0,7 | 3,1 |
| Sample 2 | 27 | 0,92 | 5,4 |

Interferences:

Bilirubin conjugated up to 60 mg/dl, free bilirubin up to 40 mg/dl, hemoglobin up to 500 mg/dl, lipemia up to 1400 mg/dl triglycerides. No interference was observed by ascorbic acid up to 30 mg/dl,

Correlation against a reference method

Correlation of FAR (Y) method with another kit available on the market (X) testing 85 samples gave the following result:

$$Y = 1.04 X - 0.028 \quad r = 0.997$$

DISPOSAL

The product must be used for professional analysis only. The product must be disposed of according to national/international laws.

WARNINGS AND PRECAUTIONS

Contact with the skin and ingestion should be avoided. Use the normal precautions expected with chemicals utilization.

REFERENCES

- Norris KA et al Clin. Chem. (1975) 21:1093.
- Forrester RL et al. Clin. Chem.(1976) 22: p.243-245.

MANUFACTURER

FAR
Via Fermi, 12 - 37026 Pescantina - VERONA - ITALY
tel +39 045 6700870
website <http://www.farddiag.com>
e-mail: order@farddiag.com
e-mail: farddiag@farddiag.com

KEY SYMBOLS