SPECTRUM

The Creative Approach to Bioscience

# Carbon Dioxide ($CO_2$) (Colorimetric PEPC)

REF: 228 001 50 Test
REF: 228 002 100 Test

**SYMBOLS IN PRODUCT LABELLING**

| | | | |
|---|---|---|---|
| EC REP | Authorised Representative | | Use by/Expiration Date |
| IVD | For in-vitro diagnostic use | | CAUTION. Consult instructions for use |
| LOT | Batch Code/Lot number | | |
| REF | Catalogue Number | | Manufactured by |
| | Consult instructions for use | | (Xi) - Irritant |
| | Temperature Limitation | | |

## Intended Use

Spectrum diagnostics carbon dioxide reagent is intended for the in-vitro quantitative diagnostic determination of carbon dioxide in human serum or plasma on both automated and manual systems

## Background

Approximately 90% of total carbon dioxide present in serum is in the form of bicarbonate.Measurement of bicarbonate together with glucose, Na+, K+ and chloride is useful in assessment of disturbances of acid base balance resulting from metabolic or respiratory causes.

## Assay Principle

Colorimetric test for the quantitative determination of Carbon Dioxide ($CO_2$) in serum and plasma :

Phophoenolpyruvate + Bibarbonate + NADH $\xrightarrow{\text{PEPC \& MDH}}$ Phosphate + Malate + NAD+

## Reagents

**$CO_2$ Calibrator C** As stated on the vial label

**Reagent (R)**

| Components | ( concentrations in the test ) |
|---|---|
| TRIS-Buffer | (pH 7.5) |
| PEP; PEPC; NADH | (as reduced cofactor) |
| MDH Activators, stabilizers, detergents | |
| Sodium Azide | 0.095% |

For further information, refer to the Carbon dioxide reagent material safety data sheet.

## Precautions and Warnings

Do not ingest or inhalate. In case of contact with eyes or skin; rinse immediately with plenty of soap and water. In case of severe injuries; seek medical advice immediately.

## Reagent Preparation, Storage and Stability

The reagents are supplied ready to use.Carbon dioxide reagent is stable up to the expiry date stated on the vial label when stored at 2-8 $^{o}$C.Once opened , the reagent is stable for 1 months at the specified temperature if contamination is avoided.
**Don't freeze reagents**

## Deterioration

Failure to recover control values within the assigned range may be an indication of reagent deterioration.

## Specimen collection and preparation

Serum, heparin plasma
Don't use citrate or oxalate plasma

Samples should be used immediately and can be stored at 2-8°C for 1 hour tightly closed .
Discard contaminated samples.

## System Parameters

| | |
|---|---|
| Wavelength | 405 nm or 415 nm |
| Optical path | 1 cm |
| Assay type | Fixed Rate |
| Direction | Decrease |
| First read time | 120 seconds |
| Delay time | 60 seconds |
| Last read time | 180 seconds |
| Temperature | 37 $^{o}$C |
| Zero adjustment | Dist.H2O |

## Procedure

| | Blank | Calibrator | Sample |
|---|---|---|---|
| **Reagent** | 1.0 ml | 1.0 ml | 1.0 ml |
| **Calibrator** | ..... | 10 µl | ..... |
| **Sample** | ..... | ..... | 10 µl |

Mix well and incubate for 2 minutes.Then,read the absorbance of A1 and exactly after 1 min read A2, Determine ΔA=A1-A2 .

## Calculation

$$CO2\ conc.(mmol/L) = \frac{(A_{sample}) - (A_{Blank})}{(A_{Calibrator}) - (A_{Blank})} \times \text{conc. of calibrator}$$

## Quality Control

Normal and abnormal commercial control serum of known concentrations should be analyzed with each run.

## Performance Characteristics

### Precision

Within run (Repeatability)

| | Level 1 | Level 2 |
|---|---|---|
| **n** | 20 | 20 |
| **Mean** (mmol/L) | 15 | 18 |
| **SD** | 0.2 | 0.16 |
| **CV%** | 1.33 | 0.89 |

Run to run (Reproducibility)

| | Level 1 | Level 2 |
|---|---|---|
| **n** | 20 | 20 |
| **Mean** (mmol/L) | 17 | 21 |
| **SD** | 0.32 | 0.22 |
| **CV%** | 1.88 | 1.05 |

## Methods Comparison

A comparison between Spectrum Diagnostics Carbon dioxide reagent and a commercial reagent of the same methodology was performed on 20 human sera. A correlation of 0.977 was obtained.

## Sensitivity

When run as recommended, the minimum detection limit of the assay is 1 mmol/L.

## Linearity

The reaction is linear up to a Carbon dioxide concentration of 50 mmol/L; specimens showing higher concentration should be diluted 1+1 using physiological saline and repeat the assay (result × 2).

## Interfering Substances

Triglycerides (1000 mg/dL) does not affect the results.
Hemoglobin (>500 mg/dL) does not affect the results.
Bilirubin (>40 mg/dL) does not affect the results.
Other drugs and substances may interfere.

## Expected Values

22 – 29 mmol/L
Note: it is recommende that each laboratory should establish its own reference range.

***Spectrum Diagnostics does not interpret the results of a clinical laboratory procedure; interpretation of the reults is considered the responsibility of qualified medical personnel. All indications of clinical significance are supported by literature references.***

## Analytical Range

1 - 50 mmol/L

## Waste Disposal

This product is made to be used in professional laboratories.
Please consult local regulations for a correct waste disposal.
**S56:** dispose of this material and its container at hazardous or special waste collection point.
**S57:** use appropriate container to avoid environmental contamination.
**S61:** avoid release in environment. refer to special instructions/safety data sheets.

## References

1.Van Slyke D.D. and W.C. Stadie, *J. Biol. Chem.* 49:1 1 (1921)
2. Sterling, R., and O. Flores, *Clin. Chem.* 18:544(1972)

| ORDERING INFORMATION | |
|---|---|
| **CATALOG NO.** | **QUANTITY** |
| 228 001 | 2 x 25 ml |
| 228 002 | 4 x 25 ml |

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