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 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.

Method

Colorimetric PEPC method

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 Carbon dioxide reagent and a commercial reagent of the same methodology was performed on 200 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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