



Airborne Labs International

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Carbon Dioxide (CO₂) Analysis Coca-Cola® Beverage Grade Program

Customer

Phone:

Attn.:

E-Mail:

Sample ID.: Vaporized Liquid CO₂:

Sample ID.: Received in 2L True Blue Tedlar Polybag 1.2 + MiniCyl 1.0 + NVR 8.0 No-Haz Kits

ALI Track No.:

Received On:

Report Date:

Invoice No.:

Sample Date:

Sample Form: Vaporized Liquid CO₂

Process Stage: Final

Test Description/Units:

	Result	LOQ	Specification
CO₂ Identification (% v/v by USP): _____ Comments: All gas sampling bags tested & found to contain 99+% CO ₂ .		5	report*
CO₂ Purity (% v/v, ISBT 4.0): _____ Comments: Obtained by NCG + target list impurity subtraction method.		5	99.9 min
Moisture (H ₂ O, ppm v/v, ISBT 3.0): _____		1	20 max
Oxygen (O ₂ , ppm v/v, ISBT 4.0): _____ Comments: Result represents Total O ₂ + Ar ppm v/v.		1	30 max
Carbon Monoxide (CO, ppm v/v, ISBT 5.0): _____		1	10 max
Ammonia (NH ₃ , ppm v/v, ISBT 6.0): _____		0.5	2.5 max
Oxides of Nitrogen (NO _x , ppm v/v, ISBT 7.0): _____		0.5	report*
Nitric Oxide (NO, ppm v/v, ISBT 7.1): _____		0.5	2.5 max
Nitrogen Dioxide (NO ₂ , ppm v/v, ISBT 7.1): _____		0.5	2.5 max
Non-Volatile Residue (NVR, ppm w/w, ISBT 8.0): _____ Comments: No NVR content was observed.		2	10 max
Non-Volatile Organic Residue (NVOR, ppm w/w, ISBT 8.0): _____ Comments: No NVOR content was observed.		2	5 max
Methanol (MeOH, ppm v/v, ISBT 9.0): _____		0.1	10 max
Total Volatile Hydrocarbons (THC, ppm v/v as CH ₄ , ISBT 10.0): _____ Comments:		0.1	50 max (20 as TNMHC)
Total Non-Methane Hydrocarbons (TNMHC, ppm v/v as CH ₄ , ISBT 10.1): _____		0.1	20 max
Methane (CH ₄ , ppm v/v, ISBT 10.1): _____		0.1	report
Acetaldehyde (AA, ppm v/v, ISBT 11.0): _____		0.05	0.2 max
Aromatic Hydrocarbon Content (ppb v/v as Benzene, ISBT 12.0): _____ Comments: No target BTEX impurities detected.		2	20 max
Total Sulfur Content (TSC, ppm v/v as S, ISBT 13.0): _____		0.01	0.1 max
Hydrogen Sulfide (H ₂ S, ppm v/v, ISBT 14.0): _____		0.01	report
Carbonyl Sulfide (COS, ppm v/v, ISBT 14.0): _____		0.01	report
Dimethyl Sulfide (DMS, ppm v/v, ISBT 14.0): _____		0.01	report
Sulfur Dioxide (SO ₂ , ppm v/v, ISBT 14.0): _____		0.02	1.0 max
Sensory Tests			
Odor & Appearance of Snow Test (Pass/Fail, ISBT 15.0): _____ Comments: *An ISBT 15.0 snow test requires a 5.9L cylinder sample.		na	No foreign odor
Odor of Solid CO₂ Residue (Pass/Fail): _____ Comments: Sensory odor & visual residue tests performed on submitted 1L NVR can.		na	No foreign odor
Appearance of Solid CO₂ Residue (Pass/Fail): _____ Comments: Sensory odor & visual residue tests performed on submitted 1L NVR can.		na	No foreign appearance
Appearance in Water (Pass/Fail, ISBT 16.0): _____		na	No color or turbidity
Odor & Taste in Water (Pass/Fail, ISBT 16.0): _____ Comments:		na	No foreign odor or taste

Source Specific Tests

Hydrogen Cyanide (HCN, ppm v/v, ISBT SM 1.0):	-----
Vinyl Chloride (VCl, ppm v/v, ISBT SM 2.0):	-----
Phosphine (PH ₃ , ppm v/v, ISBT SM 3.0):	-----

Comments:

<u>Result</u>	<u>LOQ</u>	<u>Specification</u>
	0.2	nd
	0.1	nd
	0.25	0.3 max

Speciated Volatile Hydrocarbons (VHC, ppm v/v by ISBT 10.1)

Ethane:	-----
Ethylene:	-----
Propane:	-----
Propylene:	-----
Isobutane:	-----
n-Butane:	-----
Butene:	-----
Isopentane:	-----
n-Pentane:	-----
Pentene:	-----
Hexanes+:	-----

0.1	report*
0.1	report*
0.1	report*
0.1	report*
0.1	report*
0.1	report*
0.1	report*
0.1	report*
0.1	report*
0.1	report*
0.1	report*

Comments: Pk ID based upon t_r match vs target analyte std. CH₄ result on pg 1.

Speciated Volatile Sulfur Compounds (VSC, ppm v/v by ISBT 14.0)

Carbon Disulfide:	-----
Methyl Mercaptan:	-----
Ethyl Mercaptan:	-----
t-Butyl Mercaptan:	-----
Isopropyl Mercaptan:	-----
n-Propyl Mercaptan:	-----
Methyl Ethyl Sulfide:	-----
2-Butyl Mercaptan:	-----
i-Butyl Mercaptan:	-----
Diethyl Sulfide:	-----
n-Butyl Mercaptan:	-----
Dimethyl Disulfide:	-----
Unknown VSC:	-----

0.01	report*
0.01	report*
0.01	report*
0.01	report*
0.01	report*
0.01	report*
0.01	report*
0.01	report*
0.01	report*
0.01	report*
0.01	report*
0.01	report*
0.01	report*

Comments: Peak ID based upon t_r match against target analyte standards. Note: TSC + most common sulfur agents reported on pg. 1.

Speciated Volatile Oxygenates (VOX, ppm v/v, by ISBT 11.0)

Dimethyl Ether:	-----
Diethyl Ether:	-----
Ethylene Oxide:	-----
Propionaldehyde:	-----
Acetone:	-----
t-Butanol:	-----
Ethanol:	-----
Isopropanol:	-----
Ethyl Acetate:	-----
Methyl Ethyl Ketone:	-----
2-Butanol:	-----
n-Propanol:	-----
Isobutanol:	-----
n-Butanol:	-----
Isoamyl Acetate:	-----
Isoamyl Alcohol:	-----
Unknown VOX:	-----

0.1	report*
0.1	report*
0.1	report*
0.1	report*
0.1	report*
0.1	report*
0.1	report*
0.1	report*
0.1	report*
0.1	report*
0.1	report*
0.1	report*
0.1	report*
0.1	report*
0.1	report*
0.1	report*

Comments: Peak ID based upon t_r match against target analyte standards. AA + MeOH results reported on pg. 1.

LOQ = Limit of Quantitation (lowest amount of analyte quantitatively determined with suitable precision and accuracy) MDL = method detection limit (lowest amount of analyte detected). trace = unquantified amount observed between LOQ and MDL. nd = indicates the impurity was not detected (below MDL). -- = test not performed. na = not available. LT = less than the amount specified. GT = greater than the amount specified. % = percent. ppm = parts per million. ppb = parts per billion. report = value needed for Coca-Cola® supplier specification. report* = Additional value to the Coca-Cola® supplier requirement. v/v = volume analyte/volume sample. w/w = weight analyte/weight sample. [result] indicates the result was obtained by the method listed within brackets. TSC = ISBT Total Sulfur Content excluding SO₂. Unit Conversions: 1 ppm v/v = 1µL/L = 1000 ppb = 0.0001% v/v. Date format: MM/DD/YY.

Report Summary:

Customer requested a standard Coca-Cola® beverage grade LCO₂ test program.
This sample meets all Coca-Cola® purity guidelines for beverage grade LCO₂.

Reviewed by / Date:

Laboratory Manager

mm/dd/yyyy

Laboratory Manager

Attachments: none
Addendum: Signatures, Instrument & Notebook data on-file

ISO Statement

Statements of conformity (pass or fail) resulting from the test/analysis performed on the above sample will not take into account the reported measurement uncertainty unless otherwise specified. This is a shared risk decision rule in which the customer also has responsibility for determining acceptance of the results. The methods Airborne Labs International uses are developed by Airborne Labs International and are based on the current revisions of international, national, or industry standards unless otherwise specified. The acceptance criteria of the above item are based on ISBT specifications, NFPA, CGA, USP, or other industry specifications unless otherwise specified on the contract.



Accreditation # 68099