

Application Note

Measurement of Gas volume and Air content in Japanese spirit with soda & fruit juice by Gas Volume Analyzer

Industry	:	Food & beverage
Instrument	:	Gas Volume and Air Content Analyzer
Measurement method	:	Gas volume measurement method
Standards	:	

1. Scope

On the bottling process of Japanese spirit with soda & fruit juice manufacturing, measurement of gas volume and air content are essential for quality control of products. This application note introduces the measurement example of gas volume and air content of in commercially-available Japanese spirit with soda & fruit juice by using the Gas Volume and Air Content Analyzer.

2. Precautions

- 1) This measurement requests uses of 6mol/L sodium hydroxide aqueous solution. Contact with eyes may cause blindness. Be sure to wear protective goggles during handling.
- 2) The measurement instruments and the measurement samples should be temperature-stabilized at 20 °C.
- 3) Either instrument air system or an air compressor is necessary for piercing and rotation of sample bottle/can. (Pressure: 0.490 to 0.686 MPa (5 to 7 kgf/cm²)).
- 4) After measurement of samples containing solids like small fruits pulp, wash the nozzle every 5-10 samples measurements to prevent clogging of the tubing.

3. After measurement

- 1) Samples should be disposed properly after measurement is completed.
- 2) The measurement instruments should be rinsed properly after the end of the day.

4. Apparatus

- Gas Volume and Air Content Analyzer

5. Reagents

- 6 mol/L sodium hydroxide solution
- Pure water

6. Procedure

- 1) Select “gas volume / gas pressure + air content measurement (GV/P+AIR)” on the measurement mode, and enter the following parameters into the measurement conditions.

Note that below measurement parameters is an example and optimizing these parameters might be necessary depending on sample's property.

•Mode	: GV/P+AIR
•GV/P Cal.	: Soft
•Method	
Sniff. Level	: 0.015 MPa
E-Sni. Level	: 0.015 MPa
Trial Count	: 6
Press Level	: 0.010 MPa
Rot 4-1	: 0 Sec
Wait 4	: 0 Sec
Rot 4-2	: 120 Sec
Rot 4-3	: 25 Sec

- 2) Set the sample bottle/can on the sample stage and press the Start button.

For details, refer to the operation manual.

7. Example

Table 1 shows the measurement results of Japanese spirit with soda & fruit juice.

Table 1. Measurement result list of Japanese spirit with soda & fruit juice

Sample	No.	Gas Volume (v/v)	Air Volume (mL)	Gas Press (MPa)	Press (MPa)	Temp. (°C)
Japanese spirit with soda & fruit juice A	1	1.57	26.7	0.080	0.056	15.2
	2	1.58	27.7	0.081	0.059	15.6
	3	1.57	27.8	0.080	0.056	15.1
	Ave.	1.57	27.4	0.080	0.057	15.3
	SD	0.01	0.6	0.001	0.002	0.3
	RSD (%)	0.37	2.19	0.72	3.04	1.96
Japanese spirit with soda & fruit juice B	1	2.26	37.0	0.160	0.127	15.5
	2	2.23	36.1	0.157	0.124	15.3
	3	2.27	32.5	0.161	0.127	15.3
	Ave.	2.25	35.2	0.159	0.126	15.4
	SD	0.02	2.4	0.002	0.002	0.1
	RSD (%)	0.92	6.82	1.31	1.38	0.65

Measurement items

Gas Volume : Carbon dioxide volume (mL) of 1mL sample volume

Air Volume : Gas volume except carbon dioxide in sample bottle/can (mL)

Gas Press : Converted pressure in sample bottle/can at 20 °C (MPa)

Press : Measured pressure (MPa)

Temp . : Measured sample temperature (° C)

8. Summary

Measurement of gas volume and air content in commercially-available Japanese spirit with soda & fruit was performed with good repeatability by using the Gas Volume and Air Content Analyzer.