JFRL

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REPORT

Client: FARBELL Co., Ltd.
1-12-12 Minowa Taito-ku Tokyo 110-0011 Japan

Sample(s): Nano Virus Buster The GEL

Title: Deodorizing Effect Test

Received date of sample(s): March 06, 2018

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Signed for and on behalf of JFRL

JAPAN FOOD RESEARCH LABORATORIES

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Section of Analysis Documentation

Apr. 11, 2018
Date

Deodorizing Effect Test

1. Client

   FARBELL Co., Ltd.

2. Sample

   Nano Virus Buster The GEL

3. Outline of method

   The deodorizing effect of the sample against ammonia, trimethylamine, methyl mercaptan, hydrogen sulfide and acetaldehyde was tested by gas detector tube method or gas chromatography.

4. Results

   Tables 1 to 5 and Figures 1 to 4 show the test results.

Table 1. Test results: Ammonia (Units: ppm)

Test specimen	Time period			
	10 min	30 min	1 h	3 h
Sample	60	34	10	<1
Blank	100	100	97	91

Initial ammonia gas concentration: About 100 ppm
<1: Less than the quantitation limit (1 ppm)

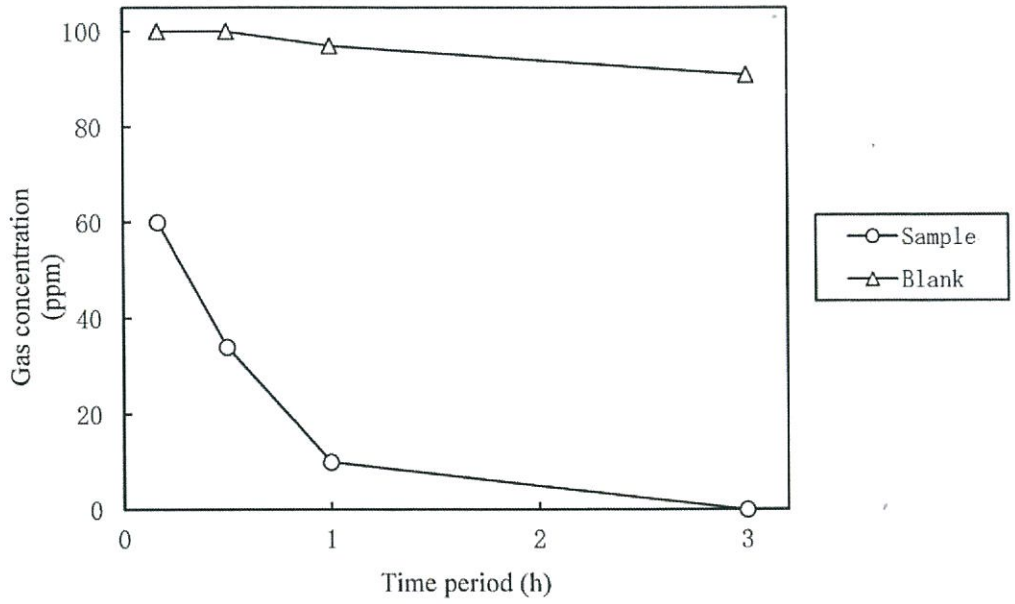

Figure 1. Test results: Ammonia

Table 2. Test results: Trimethylamine (Units: ppm)

Test specimen	Time period			
	10 min	30 min	1 h	3 h
Sample	50	42	22	<1
Blank	70	70	70	70

Initial trimethylamine gas concentration: About 70 ppm
<1: Less than the quantitation limit (1 ppm)

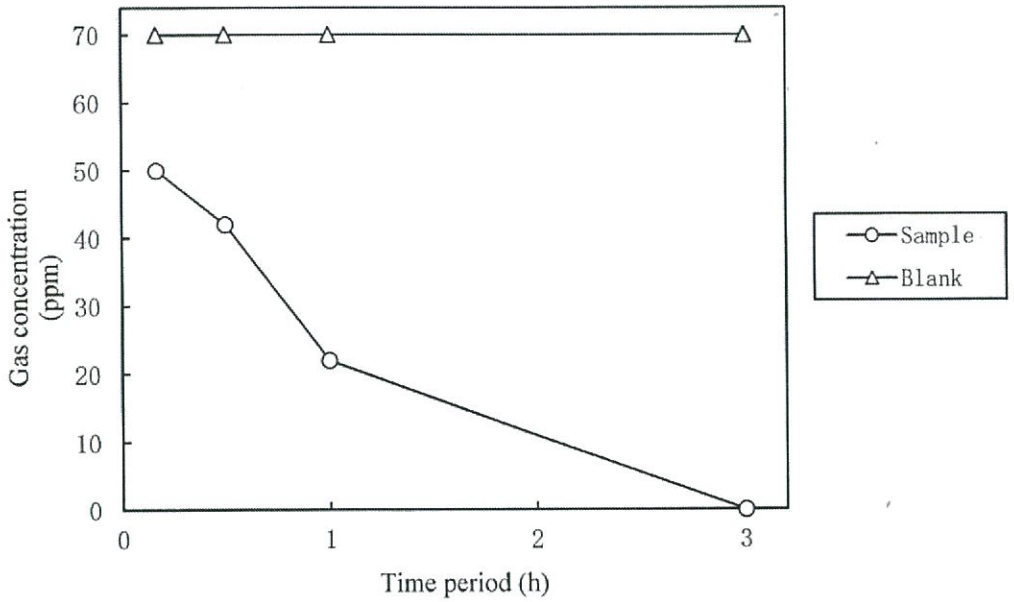

Figure 2. Test results: Trimethylamine

Table 3. Test results: Methyl mercaptan (Units: ppm)

Test specimen	Time period (min)	
	10	30
Sample	0.1	<0.1
Blank	8.0	8.0

Initial methyl mercaptan gas concentration: About 8.0 ppm
<0.1: Less than the quantitation limit (0.1 ppm)

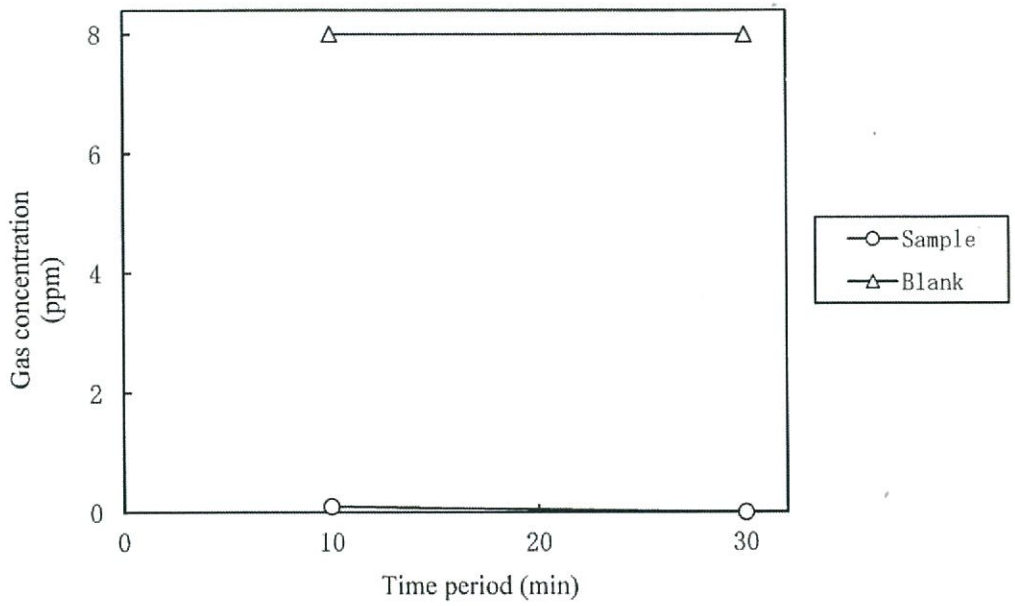

Figure 3. Test results: Methyl mercaptan

Table 4. Test results: Hydrogen sulfide (Units: ppm)

Test specimen	Time period
	10 min
Sample	<1
Blank	20

Initial hydrogen sulfide gas concentration: About 20 ppm
<1: Less than the quantitation limit (1 ppm)

Table 5. Test results: Acetaldehyde (Units: ppm)

Test specimen	Time period			
	10 min	30 min	1 h	3 h
Sample	16	10	3	<1
Blank	20	20	20	20

Initial acetaldehyde gas concentration: About 20 ppm
<1: Less than the quantitation limit (1 ppm)

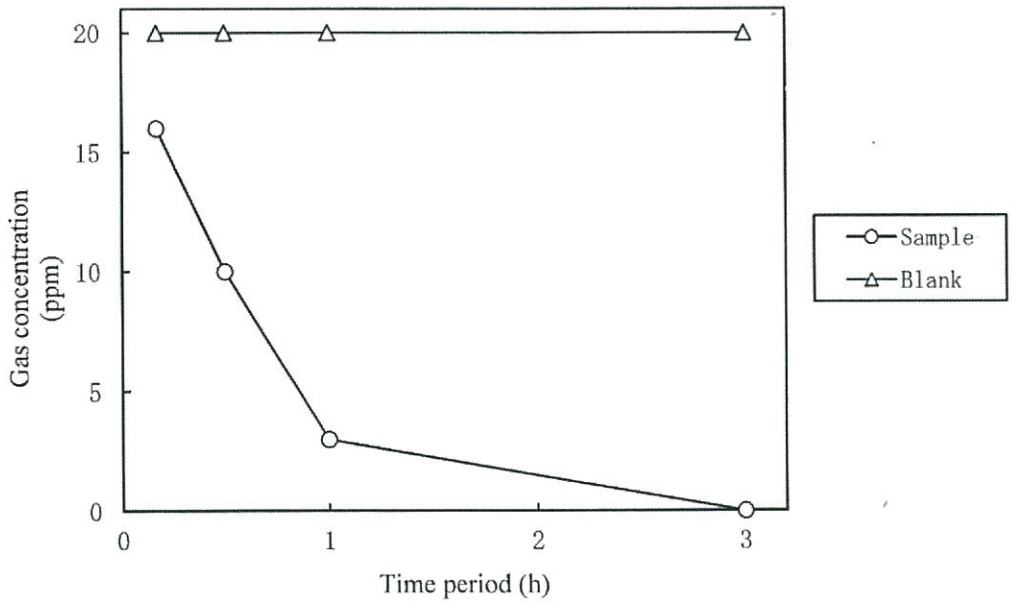

Figure 4. Test results: Acetaldehyde

5. Methods in detail

1) Reagents and equipment

Film bag (35 cm × 50 cm, ARAM Corporation)
Film bag (35 cm × 50 cm, GL Sciences Inc.)
Ammonia gas: Generated from ammonia solution (28 %, Special grade, Koso Chemical Co., Ltd.)
Trimethylamine gas: Generated from trimethylamine solution (28 %, Tokyo Chemical Industry Co., Ltd.)
Methyl mercaptan gas: Generated from a mixture of sodium methyl mercaptan solution (15 %, Koso Chemical Co., Ltd.) and diluted sulfuric acid.
Hydrogen sulfide gas: Generated from a mixture of iron sulfide II (For generation of hydrogen sulfide gas, Koso Chemical Co., Ltd.) and diluted sulfuric acid.
Acetaldehyde gas: Generated from acetaldehyde (First grade, Wako Pure Chemical Industries, Ltd.)
Gas detector tube (GASTEC CORPORATION)

2) Procedures

The sample was put in a film bag. After the bag was heat-sealed, 9 L of air was injected into the bag. Next, the testing gas was added to the specified concentration and the bag was allowed to stand at room temperature. The gas concentration in the bag was measured by gas detector tube method or gas chromatography at each measurement time. The operating conditions of the gas chromatograph are shown below.

As a blank test, the testing gas alone (without the sample) was tested in the same manner.

Table 6 shows the test conditions.

<Measurement conditions>

Acetaldehyde

Apparatus: GC-2014 (Shimadzu Corporation)
Detector: FID
Column: Thermon-3000 + KOH 5 % + 1 % Sunpak-A, 50 to 80 mesh, Glass tube, φ3 mm × 2 m
Injector temperature: 220 °C
Detctor temperature: 220 °C
Column temperature: 150 °C
Gas flow rate: Nitrogen (carrier gas), 40 mL/min
Gas pressure: Hydrogen, 50 kPa; Air, 50 kPa

Table 6. Test conditions

Amount of sample	1 piece
Testing gas (initial gas concentration)	Ammonia (about 100 ppm) Trimethylamine (about 70 ppm) Methyl mercaptan (about 8.0 ppm) Hydrogen sulfide (about 20 ppm) Acetaldehyde (about 20 ppm)
Temperature	Room temperature
Measurement time	After 10 and 30 minutes, and after 1 and 3 hours (If the measurement value becomes below the quantitation limit, the test is stopped.)

End of Report