

TEST REPORT

Applicant : Hulight Co., Ltd.

60, Haan-ro, Gwangmyeong-si, Gyeonggi-do

Test Item : Molecular Hydrogen Inhalation Device• **Manufacturer & Model :** Hue Light Co., Ltd. / H-2000• **Serial No. :** HLH2-22-003**Date of Receipt :** 21 December 2022**Date of Test :** 26 January 2023**Description of Test**• **Test Name :** Gas analysis• **Test Site :** ☒ KRISS Lab ☐ Mobile Lab ☐ On-site• **Environmental Conditions**- **Temperature :** 20 ~ 22 °C- **Relative Humidity :** 40 ~ 60 %• **Test Method :**

Test Procedure of Mixture and Pure Gas Measurement with Gas MS(T-02-030-2000)

Test procedure of purity analysis of raw material(T-02-055-2017)

• **Test Results :**

Refer to the "TEST RESULTS" on the next page(s).

• **Measurement Uncertainty :**

Refer to the "TEST RESULTS" on the next page(s).

General Information

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- The above results are valid only for the sample provided by the applicant, and the name of the sample is provided by the applicant.

• **Date of Issue :** 26 January 2023• **Tested by :** Lee, Jin Bok• **Approved by :** Jung, Jin Sang**President of KRISS**

TEST RESULTS

1. Request details

Hue Light Corp. requested for analyzing the concentrations of the hydrogen, oxygen gas, impurities and the flow rate of the gas from a Molecular Hydrogen Inhalation Device (this is referred to as a "Test sample").

2. Principles of the test sample device

The test sample is a device that electrolysis water to generate hydrogen and oxygen gas. It is discharged through one water trap without separating the generated hydrogen and oxygen gas (also called brown gas).

3. Product specifications

(1) Device name: Molecular Hydrogen Inhalation Device

(2) Model No.: H-1200

(3) S/N: HLH2-22-003

4. Test procedure

(1) Test sample were installed at KRISS laboratory (Fig. 1).

(2) A sampling kit and a 10 L sampling bag were installed at the outlet to collect the gas generated from the Test sample.

(3) After operating the Test sample for about 5 hours or more, the generated gas was collected in a sampling bag.

(4) CO, CH₄, CO₂ and THC(C₂~C₄) were analyzed using GC/Detectors.

(5) H₂, O₂, Ar and N₂ concentrations were measured for the samples collected in the sampling kit using a gas precision mass spectrometer (GAS-MS).

(6) Gas flow rate was measured for 40 minutes using a calibrated wet flow meter.



Fig. 1 Equipment configuration installed in KRISS at Hue Light Co., Ltd.
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TEST RESULTS

5. Results

Components	Test results
H ₂	67.38 cmol/mol ⁽¹⁾ , Relative expanded uncertainty ($k=2$): 0.5 %
O ₂	32.44 cmol/mol, Relative expanded uncertainty ($k=2$): 1 %
N ₂	0.18 cmol/mol, Relative expanded uncertainty ($k=2$): 5 %
Ar	79.2 μmol/mol ⁽²⁾ , Relative expanded uncertainty ($k=2$): 10 %
CH ₄	N.D ⁽³⁾ (Detection limit : 0.2 μmol/mol)
CO	0.02 μmol/mol, Relative expanded uncertainty ($k=2$): 50 %
CO ₂	13.2 μmol/mol, Relative expanded uncertainty ($k=2$): 3 %
THC(C ₂ ~C ₄)	N.D(Detection limit : 0.3 μmol/mol)
Flow rate	2.17 L/min, Relative expanded uncertainty ($k=2$): 3 %

6. Analytical instruments: Gas-MS(MAT 271), GC-FID/FID-methanator, Sampling kit, sampling bag, Integrated flowmeter(Shinagawa W-NK-0.5A)
7. The measured value of the gas component is the mole fraction excluding water.
8. cmol/mol⁽¹⁾ and μmol/mol⁽²⁾ can be expressed as % and ppm, respectively.
9. N.D.⁽³⁾ is not detected.
10. The relative expanded uncertainty ($k = 2$) is a level of confidence of approximately 95%.
11. The amount of gas generated and the measured value may vary depending on the voltage and current flowing through the electrode and the area of the electrode plate.
12. <Caution> Avoid ignition sources (fire, static electricity, etc.) at the inlet of the gas outlet of this test product (hydrogen generator). If an ignition source occurs, it may cause sparks or ignition. Therefore, when using the equipment, avoid a completely enclosed space and attention must be paid to the safety of the ignition sources.
13. This test result is issued at the given date. KRISS is not responsible for any change of the sample since the issued date. This test result is valid just for the given item.
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(End of the Results).

