November 6, 2023
Sanyo Chemical Industries, Ltd.

Launch of "FlavoTone", a digital olfaction (smell sensor) that visualizes complex and diverse smells

-Providing solutions that solve various smell-related problems and create new value-

Sanyo Chemical Industries, Ltd. has announced that it has launched "FlavoTone", its digital olfaction (smell sensor) that can visualize complex and diverse smells. "FlavoTone" can visualize not only specific smells but also complex smells, making it possible to provide solutions such as quality control, characteristic comparison, and monitoring using smells.

In addition to equipment sales, we also provide services such as rental, contract analysis, and proposing solutions to individual issues. Through "FlavoTone", we will solve smell-related problems and contribute to the creation of a better social infrastructure.

Background of Development

Humans gather information, perceive situations, and make judgments through their five senses. However, relying on such sensory indicators can be ambiguous in their expression, as perceptions vary from person to person. This makes it difficult to maintain data reliability and reproducibility, and to share and accumulate data. Therefore, there is a demand for sensors that can objectively visualize sensations as an alternative to the five senses, addressing these issues.

Smell sensors that visualize the sense of smell are expected to be applied in a wide range of fields, including healthcare, food, environment, and security. However, due to the vast variety of smell compounds and the complex, unclear mechanisms involved in smell perception, the development of sensors for the sense of smell has lagged behind other senses. While specific smell-detecting sensors have been developed in the past, the widespread implementation of devices capable of recognizing complex smells like the human nose has not yet been achieved.

About the smell sensor "FlavoTone"

The human nose is believed to identify smells when smell molecules adhere to olfactory receptors, causing olfactory cells to emit electrical signals, which are then transmitted to the brain for smell recognition. Our smell sensor "FlavoTone" is a device that can visualize complex smells through a mechanism similar to olfaction, consisting of a smell-responsive material corresponding to an olfactory receptor, a probe that detects smells through changes in electrical properties caused by the adsorption of smell molecules, and an analysis application that identifies smells based on the obtained signal patterns. The device is capable of visualizing complex smells.

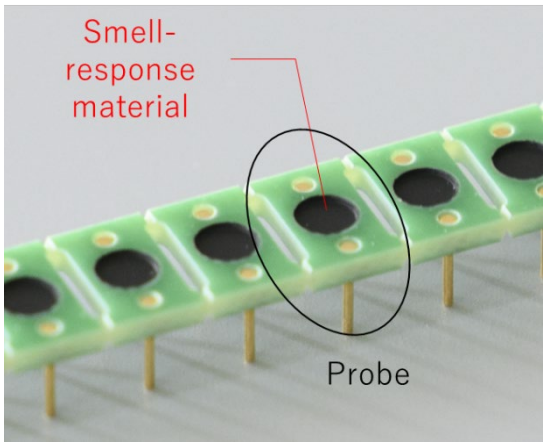
One of the key technologies that enables the visualization of complex smells is the smell response material used in the probe. The smell response material, designed based on our proprietary design, is composed of resin material, additives, and conductive material, and others. It has the property of swelling when smell molecules are adsorbed. Compared to the response materials used in conventional smell sensors, it is relatively easy to alter the response characteristics to smell molecules over a wide range "FlavoTone" is equipped with multiple probes with different response characteristics, and by combining these probes, it is possible to recognize even complex smells. It is also superior in that it is relatively insensitive to the effects of the external environment, such as the humidity in the atmosphere.

In addition, we have incorporated an application that analyzes the acquired data using

machine learning. This allows for tailored outputs based on various needs and applications such as quality control, characteristic comparisons, and monitoring.

We believe that this smell sensor “FlavoTone” can provide new value in a wide range of fields including food, healthcare, cosmetics, safety and disaster prevention, factories, and the environment, enhancing efficiency, convenience, and accuracy. It enables anomaly detection and promotes marketing and branding.

We provide services such as rentals, contract analyses, and proposing solutions for individual issues, enabling a wide range of applications for many companies and research institutions. In the future, we will contribute to building a better social infrastructure by co-creating with our customers to address diverse consumer needs and increasingly complex societal challenges



Overview of “FlavoTone”

FlavoTone" tabletop machine

<Features>

・Capable of identifying complex and diverse smells.
・Simple and highly scalable.
・Resistant to external environmental influences, ensuring highly stable and reproducibility in sensing.
・Customizable in terms of the type and number of probes used depending on the measurement target.
・No need for complex measurement methods or preparation like gas chromatography.
・Relatively short measurement time.

<Example of possible solutions>

(1) Quality control

i) Food industry

It is expected to prevent the distribution of inferior and unsafe food products by detecting unpleasant odors indicating spoilage or contamination of meat, seafood, dairy products, packaged foods, etc.

ii) Pharmaceutical and chemical industries

It contribute to quality control by detecting abnormal smells present in raw materials.

iii)Cosmetic industry

It supports understanding the characteristics of fragrances in perfumes, lotions, and other beauty items.

iv)Automotive industry

It is expected to detect smells caused by manufacturing defects, volatile organic compounds (VOCs), the presence of mold, etc.

(2) Characteristic comparison

i) Home appliance industry

For example, a smart refrigerator equipped with a smell sensor detects food spoilage and alerts the user, contributing to improving safety and reducing food waste.

ii) Cleaning industry

The ability to detect and quantify smells before and after use can be expected to demonstrate the effectiveness of the product.

iii) Transportation industry

It supports the maintenance of a clean and fresh interior space in the car.

iv)Travel industry

It helps maintain and promote a comfortable indoor environment in hotels, resorts, airlines, etc.

v) Beverage industry

It can be expected to serve as evidence of differentiation from existing products when developing and marketing new products.

(3) Monitoring

i) Manufacturing industry

Detecting the presence of toxic gases, volatile organic compounds (VOCs), and issuing warnings can contribute to ensuring the safety of workers.

ii) Retail industry

Monitoring the indoor environment within the store contributes to enhancing customer experience and increasing sales.

iii) Petrochemical industry

Continuously monitoring odor levels allows for the identification of abnormal smells related to leaks, spills that may cause operational problems.

iv) Medical care
Certain diseases and symptoms are said to have specific smells. It is expected to play a role as a disease marker.

*We have opened a new Japanese web site for smell sensors.
https://kaori.sanyo-chemical.co.jp/

About Sanyo Chemical

Sanyo Chemical established in 1949 in Kyoto, Japan, is a global manufacturer and seller of performance chemicals. Beginning as a manufacture of soap and texture agents we have since diversified our product portfolio to meet the needs of the market, Today, we feature over 3,000 different types of products and have established an international presence. Our portfolio of chemicals spans a variety of industries and types, from automotive components to daily-use electronics, as well as cosmetics and medical equipment, all with the aim of creating ore safe and environmentally friendlier offerings, improving lives and societies across the world. We aim to contribute to realize a sustainable society through our corporate activities.
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