

KAMINA Electronic Nose

Affordable Odor Analysis for a Variety of Applications

Odor analysis is an emerging market that has offered isolated solutions for specialized applications so far. The smelldelect project is aimed at developing, manufacturing, and commercializing a portable odor analyzer for everyday tasks in private life and industry. This so-called electronic nose, eNose for short, is to be inexpensive, capable of learning, and, hence, universally useable.

smelldelect Project

Within the framework of the smelldelect project, Karlsruhe Institute of Technology (KIT) has transferred its know-how in odor analysis to smelldelect GmbH (Deckenpfronn, Germany), a company established in December 2017, under

a license contract. The company is to set up industrial production and to commercialize the product. The odor sensor developed and smart evaluation of the sensor data shall remain with KIT and will be further developed there. The smelldelect company was established by the former project partners of KIT JVI-Eletronik (Deckenpfronn, Germany) and Fire Eater (Hillerød, Denmark). Both companies cooperated with KIT under the EU-funded SmokeSense project in 2015. The result of this project was the joint development of a smart fire detector based on an e-nose.

The artificial nose has a size of a few centimeters only and consists of a chip with nanowires made of tin dioxide. After a certain pattern has been taught to the chip, the odor sensor can identify it within seconds.



smelldelect demonstrator

KAMINA

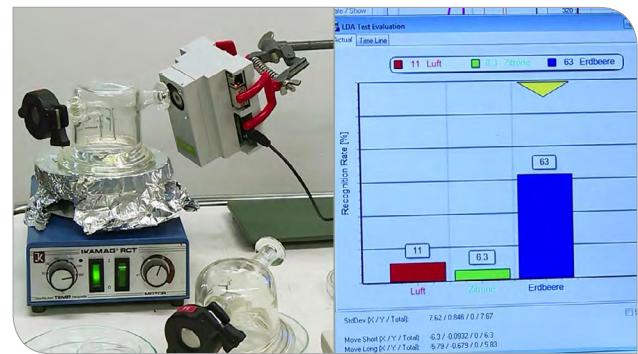
The presently available e-nose is based on the KIT-developed KAMINA (Karlsruhe Micro Nose). The functioning principle, components, and setup of the latest version were optimized considerably to achieve an inexpensive product. This product is designed for the industrial and private mass market. Wherever expensive instruments are encountered for precise chemical analysis of gas components, the e-nose is to offer a quick and easily useable solution. It will supply the essential information as to whether an odor is harmless or what type of odor it is. For more precise analyses, the system may be combined with other sensors.



Sensor chip with 16 subsensors

Wide Application Spectrum

In analogy to the biological nose, the instrument can be taught various odors by the user. This opens up a nearly universal range of applications: apart from the smart fire detector that detects smoldering substances already, also room air monitoring can be carried out. "Use in food control and characterization is also feasible, for instance, to check the quality of fish, meat or honey," says Dr. Martin Sommer of KIT's Institute of Microstructure Technology. Other applications can be found in the areas of plant monitoring and production control, medical technology, environmental monitoring, and security. "A future goal is to integrate the sensor into smartphones," Sommer says. The so far neglected analysis of omnipresent odors will complete sensor information on the environment.



smellDect demonstrator in operation (figure on the left). For detection of the odor of strawberries compared to room air and the odor of lemons (figure on the right)

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