

Selection Method of Sensing Membranes in Odor-Sensing System

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An odor-sensing system using a quartz-resonator sensor array and neural network pattern recognition had been previously developed for the identification of whiskey aromas, perfumes and flavors. In this report, this sensing system is modified for the identification of nut flavor, by changing the membrane coatings in the sensors. The membrane selection method, which is based on statistics, is described. This method was applied to the selection of the membranes suitable for the identification of nut flavors, and successful results were obtained by principal component analysis.

1. Introduction

In the fields of food, drink, cosmetic and environmental testing, a human sensory test is performed for quality control of aromas or for odor identification. However, the results of this test are sometimes influenced by the bodily condition and the mood of the inspector. Therefore, it is desired that the test be performed by an artificial odor sensing system, so that the evaluation method will be objective.

It is possible to mimic the olfactory system of a living body in order to realize an odor-sensing system. Physiological studies have shown that the output pattern from many receptors with partially overlapping specificity is recognized by an olfactory neuron network.⁽¹⁾ Several researchers have employed plural gas sensors and applied pattern recognition techniques to sensor outputs in order to classify gases.⁽²⁻⁷⁾