

A Molecular Recognition System for Odorants Incorporating Biomimetic Gas-Sensitive Devices Using Langmuir-Blodgett Films

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We constructed a molecular recognition system incorporating biomimetic gas-sensitive devices using surface acoustic wave (SAW) devices with Langmuir-Blodgett (LB) films as the gas-sensitive films. The quantity of adsorbed odor gas was determined by measuring the frequency change of an SAW device in an oscillating circuit. An odor recognition system incorporating six kinds of gas-sensitive devices using LB films of different amphiphilic materials has been developed. In the present application, the pattern recognition of commercial fragrances was successfully achieved. The result demonstrates that an odor recognition system, possessing a property similar to human olfaction, can be realized.

1. Introduction

Recently trials to realize artificial olfaction have been increasing.^{1,2)} The combination of a group of sensitive films with different properties, and pattern recognition, of adsorption is a basic technique in the approach to artificial olfaction. We consider that the key point to improving the performance of an odor recognition system is in the biomimetic performance of the gas-sensitive film. Thus, Langmuir-Blodgett (LB) films, similar to biomembranes in structure and in material, were ap-