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Measurement of Fish Freshness Using Potentiometric Gas Sensor

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A system of potentiometric gas sensors was used to measure the odor emitted from decomposing fish to evaluate fish freshness. An oxidation-reduction gas sensor has been developed by us for the emitted gas measurement. We have evaluated the basic responses of multiple sensor systems comprising an oxidation-reduction gas sensor developed by us, an ammonia gas sensor and a hydrogen sulfide gas sensor with regard to the indicator component of the odor emitted from decomposing fish. These sensors showed characteristic responses for dimethylamine (DMA) and trimethylamine (TMA) that are assumed to be the products of fish decomposition. When applied to the measurement of the odor of salmon and sardine, the system was able to detect the characteristic signals from individual sensors with regard to the fish degradation. The output patterns of these sensors were evaluated by the sensory test and the colony count method. The deterioration of fish quality with time could be identified by a method of principal component analysis using the signals from the three sensors. Therefore, it was indicated that fish freshness can be evaluated using three potentiometric gas sensors.

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