

## Light Addressable Potentiometric Sensor (LAPS)- Type Penicillin Sensor with Self-Assembled Monolayers and Its Image Detection

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In this study, we fabricated a light addressable potentiometric sensor (LAPS)-type penicillin sensor using the self-assembled monolayer (SAM) method and investigated its response characteristics. In addition, the application of the fabricated LAPS sensor to detect concentration distribution and speed of diffusion was also evaluated. A penicillin-sensing membrane was made using the SAM method, and immobilization was confirmed by atomic force microscopy (AFM). The enzyme response characteristics of the fabricated sensor were 60 mV/decade within the penicillin concentration range from 0.1 mM to 10 mM. The characteristics of the 2-D image resulting from the enzyme reaction between penicillin and penicillinase were also investigated. Image detection used a line scanning sampling method and required approximately 10 min for  $128 \times 128$  pixels over a  $1 \times 1$  cm sensing area.

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