

# Detection of Alcohol Vapor Using Surface Plasmon Resonance Sensor with Organic-Inorganic Hybrid Layers

Tsuyoshi Arakawa\*, Hisao Yasukawa and Katsuya Fujimoto

Department of Biological and Environmental Chemistry,  
Faculty of Humanity-Oriented Science and Engineering, Kinki University,  
11-6 Kayanomori, Iizuka, Fukuoka 820-8555, Japan

(Received September 29, 2009; accepted April 21, 2010)

**Key words:** Zirconium phosphate, titanium oxide, 2-aminoethanethiol, (3-mercaptopropyl)trimethoxysilane, alcohol vapor, surface plasmon resonance sensor

The detection of alcohol vapor using a surface plasmon resonance (SPR) sensor with an organic-inorganic hybrid was investigated. An alkyl thiol thin film alone had no sensitivity to alcohol vapor. However, when zirconium phosphate via hydroxyl aminoethanethiol interfacial layers or  $\text{TiO}_2$  via silanethiol layers was formed, a large change in incident angle was observed. The incident angle caused by the adsorption of alcohol vapor ( $\Delta\theta$ ) increased with an increase in the concentration of alcohol vapor. The sequence of the sensitivity was as follows: 2-butanol > 1-propanol > ethanol > methanol.

\*Corresponding author: e-mail: arakawa@fuk.kindai.ac.jp