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**Evaluation of sensitivity and selectivity of piezoresistive cantilever-array sensors** GENKI YOSHIKAWA, NCCR, University of Basel; IMR, Tohoku University, HANS-PETER LANG, NCCR, University of Basel, URS STAUFER, PETER VETTIGER, IMT, University of Neuchatel, TOSHIO SAKURAI, IMR, Tohoku University, CHRISTOPH GERBER, NCCR, Tohoku University
— Microfabricated cantilever-array sensors have attracted much attention in recent years due to their real-time detection of low concentration of molecules. Since the piezoresistive cantilever-array sensors do not require a bulky and expensive optical read-out system, they possess many advantages compared with optical read-out cantilever-array sensors. They can be miniaturized and integrated into a match-box sized device. In this study, we present the piezoresistive cantilever-array sensor system and evaluate its sensitivity and selectivity using various vapors of molecules, including alkane molecules with different chain length from 5 (n-pentane) to 12 (n-dodecane). Piezoresistive cantilevers were coated with different polymers (PVP, PAAM, PEI, and PVA) using an inkjet spotter. Each cantilever has a reference cantilever, constituting a Wheatstone-bridge. Each vapor was mixed with a constant nitrogen gas flow and introduced into the measurement chamber. According to the principle component analysis of data obtained, each molecule can be clearly distinguished from others. We also confirmed that this piezoresistive cantilever-array sensor system has sub-ppm sensitivity.

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