

Publication

## A cantilever array-based artificial nose

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We present quantitative and qualitative detection of analyte vapors using a microfabricated silicon cantilever array. To observe transduction of physical and chemical processes into nanomechanical motion of the cantilever, swelling of a polymer layer on the cantilever is monitored during exposure to the analyte. This motion is tracked by a beam-deflection technique using a time multiplexing scheme. The response pattern of eight cantilevers is analyzed via principal component analysis (PCA) and artificial neural network (ANN) techniques, which facilitates the application of the device as an artificial chemical nose. Analytes tested comprise chemical solvents, a homologous series of primary alcohols, and natural flavors. First differential measurements of surface stress change due to protein adsorption on a cantilever array are shown using a liquid cell. (C) 2000 Elsevier Science B.V. All rights reserved.

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