"**Microcantilever Sensors**"

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The advent of inexpensive, mass-produced microcantilevers, such as those used in atomic force microscopy, promises to bring about a revolution in the field of chemical, physical, and biological sensor development. The microcantilever resonance response such as resonance frequency, deflection, and Q-factor undergo variation due to external stimuli. The resonance response variation can be due to mass loading, surface stress or damping. When molecules adsorb on surfaces they can also produce a surface stress due to forces involved in the adsorption process. This surface stress can be observed as changes in deflections of a thin microcantilever. Chemical selectivity can be achieved by coating the cantilevers with selective film on one side. For example, we have demonstrated vapor detection of mercury, natural gas, and VOCs, with picogram sensitivity using selectively coated cantilevers. Recent work has focused on the immobilization of antibodies and enzymes to microcantilevers. These bio-coated cantilevers have been used to detect analytes by either stress or heat-induced bending of the microcantilever. We have also demonstrated detection of explosive vapors using nanoexplosions on microcantilevers. One advantage of microcantilever sensors is that they can be arrayed for simultaneous multi-analyte detection.

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