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Chemical Specificity in Nanomechanical Sensors

HAIFENG JI, Louisiana Tech University

The chemical specificity can be achieved by selection of appropriate receptors that recognize the target analyte and the recognition event can be converted into a measurable nanomechanical signal. The receptors are categorized as chemical receptors and bioreceptors. So far, the chemical receptors used for nanomechanical sensors include crown ethers, calixarenes, specific functional groups, etc. Bioreceptors include enzyme, antibody, microorganism, cell, etc. Receptor immobilization methods applied to nanomechanical sensors include self-assembled monolayers, layer- by-layer technique, polymer doping approach, and conjugation chemistries. In this presentation, the author will summarize the receptors and immobilization approaches reported for nanomechanical sensors and interpret the mechanism and dynamic relationship of recognition induced nanomechanical motions.