Contribution ID: **982** Type: **Oral (Non-Student) / orale (non-étudiant)**

WITHDRAWN A nanogap, impedance microchip for sensitive and surface tunable sensing

Thursday, 16 June 2016 13:15 (15 minutes)

We have microfabricated and evaluated the performance of nanogap conductivity/dielectric constant sensors with a novel architecture. The "apertured impedance microchips"(AIM) feature aluminum metal/silicon-oxide/silicon layers, where the top metal layer has apertures and the middle oxide layer has wells. This layered yet open geometry enables molecules to have access to detection electric fields induced by a voltage applied between the top metal/bottom silicon electrode layers. Our design rationale surmised that the AIM device's large footprint area and thin nanoscale oxide layer should enable impedance detection of molecules with high sensitivity in a variety of solvents. The present study confirms this hypothesis and explores the effects that simple surface modifications have on the device's response.

Specifically, devices were incorporated into a high performance liquid chromatography (HPLC) system already equipped with an ultra-violet–visible (UV–vis) detector. A range of analytes was injected using both normal and reverse phase modes; and the signals generated by each microchip device and UV–vis detector were recorded simultaneously and compared. The microchip devices'responses were found to vary for analytes according to the surface modification used. To demonstrate the novel dielectric constant capability of AIM, as a case study, an AIM device was used to detect left and right handed versions a synthesized chiral molecule separated by a chiral column using an insulating eluent, namely hexanes/isopropanol.

Primary author: DHIRANI, Al-Amin (University of Toronto)

Presenter: DHIRANI, Al-Amin (University of Toronto)

Session Classification: R2-6 General Instrumentation II (DIMP) / Physique générale des instruments II (DPIM)

Track Classification: Instrumentation and Measurement Physics / Physique des instruments et mesures (DIMP-DPIM)