

## **Low cost detection of pH and its effect on the capacitive behavior of micro-gap sensor**

### **Abstract**

The article describes the fabrication and characterization of silver microgap sensor on silicon substrate. By employing cheap photolithography process the proposed microgap sensor has been fabricated. The silver microgap sensor was used for pH sensing, by dropping different pH on microgap surface. To obtain the microgap sensor structure by using AutoCAD software, mask was designed. To maintain high accuracy in pattern transfer the AutoCAD design mask was transferred to chrome glass mask. The fabricated silver microgap pH sensor gap spacing was around  $03\mu\text{m}$ . From the electrical data we conclude that when the pH value varies from acidic to basic (pH 1, pH 2 to pH 11, pH 13) the value of capacitance decreased from 33pF to 8pF. The result shows that the silver microgap pH sensor has the ability to differentiate the acidic pH from basic one. The next part of the research is to decrease the microgap spacing until reach to nanosize spacing, so that can easily used for biosensing application.

**Keywords;** Capacitance, Chrome Mask, Microgap, pH, Photolithography, Sensor