

Measurement of Hydrogen Concentration Using the capacitive sensor

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Abstract:

The metal-oxide-semiconductor sensors were fabricated on n-type Si $\langle 100 \rangle$ ($0.2 \Omega \text{ cm}$) substrate with oxide film thicknesses of 37, 50, 63 and 73 nm. The Nickel gate of 100 nm was deposited on the oxide film by electron gun method. Results indicate the trapped charges in the oxide film causes a shift in the V_{FB} . The measured V_{FB} for the oxide film thicknesses of 37 and 73 nm is 1.4 and 2.5 V, respectively. Results show, when sensors are exposed to the 4000 ppm hydrogen concentration, the response (R%) is increased when the oxide film thickness is decreased. Experimental results demonstrate that the MOS sensors are sensitive to the trapped charges in the oxide film, which can be used for response and V_{FB} studies.

Keywords: Measurement, Concentration, sensor, Hydrogen.