

# Investigation properties of Au – Porous a-Si<sub>0.60</sub>C<sub>0.40</sub> as Humidity sensor

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**Abstract:** In this letter, we report the study of a humidity sensor based on porous amorphous silicon carbide (PASiC) as a function of exposure time and relative humidity (RH). Resistive humidity sensors Au–PASiC/Si(p) were fabricated through evaporating coplanar interdigital gold electrodes. The PASiC was formed by anodization of a-Si<sub>0.70</sub>C<sub>0.30</sub> in HF/ethylene glycol (ETG) solution at current density of 50 mA/cm<sup>2</sup> for 30 s. The structural properties of a-Si<sub>0.70</sub>C<sub>0.30</sub> thin films deposited by DC magnetron co-sputtering using single silicon crystal, 6H-SiC targets and the PASiC films were investigated by FT-IR and Raman spectroscopy. Hygroscopicity was studied by measuring the resistance of the PASiC under various RH. The results show that the measured resistance highly depends on the applied bias voltage. Moreover, the response signal against RH is found linear for an applied voltage of 2 V. Finally, the response and recovery times were determined around 13 s and 20 min, respectively.

**Keywords :** Porous SiC, Electrochemical etching, RH sensors, Au electrodes