

The Detection of the Physical Values of Various Solution by Using Surface Acoustic Wave

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The two-channel SAW sensor was proposed for the simultaneous detection of the density and viscosity products, relative permittivity and conductivity. Based on the theory for relative permittivity, the loss change is zero with zero conductivity solution. Even though the insertion loss was small, the frequency jumping in the oscillation circuit was observed at high concentrations. When the water or solution with a high dielectric constant is loaded onto the free surface, the SAW is applied as the propagating wave. We have measured distilled water and various mixed solutions using the SAW sensor system. Air and distilled water were alternately and continuously introduced onto the sensor surface condition. Therefore, the relationships between frequency shift and conductivity is not linear at low conductivity. The results of glycerol/distilled water mixed solutions shows the density and viscosity products and the ordinate frequency shift. It is found that the frequency shift is proportional to the square root of density and viscosity products. This corresponds to the approximate theory. As shown these results, SAW biosensor is useful not only for detecting the physical values of fluids.