عنوان مقاله:
Liquid mixture monitoring using a capacitive sensor system

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نویسنده:
P. Azimi Anaraki - *Department of Physics, Takestan Branch, Islamic Azad University, Takestan-Iran*

خلاصه مقاله:
In this paper design and operation of a capacitive cell sensor for liquid mixture monitoring is reported. The capacitive effect of small drop of different liquids in tap water was studied using this capacitive sensor. A small percentage of contaminating agents such as oil in tap water is determined with a good sensitivity. Important factors concerning operation of the sensor such as the precision, reproducibility, and stability are reported. Output variation of the measured values with the temperature (27-73.5 ˚C) is also investigated for tap water and different water mixtures. An averaged variation of 0.8348 µF/˚C in output measurement for tap water is obtained. Our results indicate an averaged variation of 0.4324 µF/˚C for the fresh oil and a variation of 0.5121 µF/˚C for the used water oil mixture. An averaged variation of 0.4840 µF/˚C for methanol, 0.5048 µF/˚C for the ethanol, and 0.8250 µF/˚C for water antifreeze mixtures are obtained. For water + salt mixture our data shows that the sensitivity change exhibits a factor of 12.69 increases in sensitivity when temperature increases from 24.7 ˚C to 40.0˚C. Hence to determine a trace impurity, this methodology provides more accurate results at low temperatures (room temperature) and requires less temperature compensation .for calibration

کلمات کلیدی:
Water, Water Mixture, Monitoring, Sensor, Capacitance, Resistance