Abstract Submitted
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Design and implementation of a wireless passive microsensor for methanol detection[1] DIEGO SANZ, CMUA. Universidad de los Andes, WALTER ROSAS, Department of Chemical Engineering. Universidad de los Andes, EDGAR UNIGARRO, CMUA. Universidad de los Andes, WATSON VARGAS, Department of Chemical Engineering. Universidad de los Andes, FREDY SEGURA-QUIJANO, CMUA. Universidad de los Andes — Methanol is a public health concern due to its toxicity, characterized by metabolic acidosis and blindness, among others. The third world population affected by the exposure to this compound is increasing, mainly due to the consumption of illicit distilled or adulterated alcoholic beverages. Although methanol is naturally present in some alcoholic drinks, the maximum allowed concentration cannot exceed 10 g of methanol per liter of anhydrous alcohol (0.4% (v/v) at 40% of ethanol) according to the general EU limit. A wireless passive microsensor was designed to detect small amounts of methanol at 40% of alcoholic dissolutions. The sensor consists of a planar inductor in series with an interdigital capacitor that changes its capacitance with the solution's dielectric constant. An antenna is used to readout the real part of the impedance to obtain the resonant frequencies for different amounts of methanol in the solution. The aim of this work was to develop a low cost wireless sensor with the capability to detect concentrations of at least 0.4% (v/v) of methanol in a 40% of alcoholic solution. The results obtained show variations of 403 kHz in the resonant frequency for changes of 0.2% (v/v) on the concentration of methanol in a 40% alcoholic ethanol-based solution.

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