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# Planar microwave sensor for detection and discrimination of aqueous organic and inorganic solutions

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## Research Highlights

1. Proposed sensor has a compact size and low-cost, which is particularly suitable for use as a biochemical sensor technology in the future.
2. Rapid detection and discrimination of sugar, salt and organic acid solutions.
3. Method detection is simple and without sample preparation.

## Abstract

A planar microwave sensor based on a coplanar waveguide (CPW) loaded with a circular split ring resonator (SRR) was developed for the detection and estimation of salts, sugars and organic acids in aqueous solution. The magnitudes of the spectra at resonance frequencies of 2.3 – 2.6 GHz were shown to provide a rapid and reliable way to measure concentrations of materials such as sucrose, sorbitol, glucose, fructose, CaCl<sub>2</sub>, NaCl, KCl, MgCl<sub>2</sub>, Na<sub>2</sub>CO<sub>3</sub> and citric acid. We generated linear and nonlinear regression prediction models built from correlations between the magnitudes of the transmission coefficient ( $S_{21}$ ) and concentration of materials using

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