

ABSTRACT:

Novel planar electromagnetic sensors designed, fabricated and tested for environmental monitoring are reported in this paper. Intensive modelling of the sensors is also discussed. Experiments were conducted to obtain the impedance characterization for each sensor and the results were compared with the simulation results. The sensors have been tested to detect nitrate contamination in distilled water from two sets of experiments. First, two nitrate forms, namely sodium nitrate (NaNO_3) and ammonium nitrate (NH_4NO_3), each of different concentration between 5 and 20 mg dissolved in 1 litre of distilled water, were used to observe the sensor response. Second, NaNO_3 and NH_4NO_3 were mixed in several different ratios in 1 litre of distilled water and the responses of the sensors were observed. The best sensor has been determined based on the interpretation from both nitrates' experimental results. Preliminary results show that the best sensor can very well detect the presence of nitrate added in distilled water and can distinguish the concentration level. The work and improvement for future consideration are also discussed in this paper.