Effects of diesel contamination on capacitance values of crude palm oil

ABSTRACT

Measurement of crude palm oil (CPO) contamination is a major concern in CPO quality monitoring. In this study, capacitive sensing technique was used to monitor diesel contamination levels in CPO. A low cost capacitive sensing system was developed by using AD7746 capacitance to digital converter. The capacitance value of CPO samples with different contamination levels (v/v%) ranged from 0% to 50% was collected at a room temperature (25°C). The objective of this study is to find a relationship between capacitance values and diesel contamination levels in CPO. The results showed that capacitance value decreased as the diesel contamination levels increased. For the 0% to 50% contamination range, the regression equation was y = 0.0002x 2 - 0.0125x + 0.936 with R 2 value of 0.96. For the 0% to 10% contamination range (where the percentage was the representative of potential contaminations levels found in CPO) the correlation equation was y = -0.02x + 0.95 with R 2 value of 0.95. These results indicated that capacitive sensing technique has potential for CPO quality monitoring.

Keyword: Crude palm oil (CPO); Capacitive sensing; Diesel contamination