

Development of interdigitated electrode molecular imprinted polymer sensor for monitoring alpha pinene emissions from mango fruit

Abstract

Alpha Pinene is a type of terpene hydrocarbons commonly emitted in substantial amounts by plants such as mango. Using Interdigitated Electrode (IDE) structure, a sensor for detecting Alpha Pinene volatile by using molecular imprinted polymer (MIP) was fabricated. The MIP membrane contained methacrylic acid, which formed specific cavities originated by target molecule. The use of Polyethylene Terephthalate (PET) as a substrate would allow a "low cost and flexible" sensor implementations. The IDE MIP sensor is capable to detect Alpha Pinepe contained. The sensor characteristics were strongly influenced by the composition ratio of cross-linker, functional monomer and template molecule. The remained molecule on MIP can be removed by immersing thus the sensor can be used repeatedly. By determining Alpha Pinene volatile released during pre-matured until matured period, one could use this as a data point as potential non destructive solution to discriminate the mango ripeness stage hence improving the quality of harvest.

Keywords

Alpha pinene; Electronic nose; Gas sensor; Interdigitated electrode; Molecular imprinted polymer