CURRENT RESEARCH AND DEVELOPMENT IN BIOTECHNOLOGY ENGINEERING AT IIUM

VOLUME II

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CHAPTER 18

DETECTION OF ETHANOL IN BEVERAGES USING AN ELECTRONIC NOSE

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ABSTRACT

This study has been successfully conducted to develop a method for rapid detection of ethanol (EtOH) content in beverages using IIUM-developed portable electronic nose (E-Nose). E-Nose is a device that mimic human's olfactory system and is widely used in food analysis. However, E-Noses used in food industry are big and not portable, while the one used in this study is very handy and practical for use. The differences between this project with other existing researched is that it was used to detect EtOH content in beverages and the process parameters was optimized using Response Surface Methodology (RSM). The data was analyzed using Design Expert v6.0.8. Results from this study revealed that the device could be used for rapid detection of EtOH content in various beverages such as alcoholic beverages, isotonic drinks, soft drinks and fruit juices sold in Malaysia. The sensor used was high in accuracy and reliability, where it could detect EtOH content as low as 0.1% (v/v), with the lowest voltage output of 0.43V.

Keywords: E-Nose, Ethanol content, *halal*, Response Surface Methodology.

INTRODUCTION

E-Nose is an important device used in the Food Industry and can gives many benefits to the consumers. This research is important for the consumer since the IIUM fabricated E-Nose was designed as a portable one that people can brings the device along and test for the EtOH content in their foods and beverages. If they have any doubt regarding their foods, they can just put the device on it and the E-Nose will give the result on-line.

The significance of this research is to calibrate the newly developed portable E-Nose and validate as well as screen the beverages sold in Malaysia's for the presence of EtOH content. Sample of beverages which are going to be tested are alcoholic beverages, fruit juices, soft drinks and energy drinks. One of the major problems in Malaysia's market is that, there might be some products consist of EtOH content without being mentioned on the product's label (Azah et al., 2008).