ANALYSIS OF FURFURAL IN BABY FOOD SAMPLES USING SOLID-PHASE MICROEXTRACTION (SPME) AND GAS CHROMATOGRAPHY-MASS SPECTROMETRY (GC-MS)

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Final Year Project Report Submitted in
Partial Fulfilment of the Requirements for the
Degree of Bachelor of Science (Hons.) Chemistry
in the Faculty of Applied Sciences
Universiti Teknologi MARA

JULY 2014

ACKNOWLEDGEMENTS

In the name of Allah S.W.T the most Merciful and The Most Gracious, I finally complete this thesis. Upon completion of this project, I would like to express my gratitude to many parties. My heartfelt thanks goes to my supervisor, Associate Professor Zuraidah Binti Abdullah Munir for her guidance and advice upon completing this thesis. Besides that, I would also thank my family and friends for the motivation and support throughout the course of this project.

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TABLE OF CONTENTS

ABSTRACT

ANALYSIS OF FURFURAL IN BABY FOOD SAMPLES

The presence of furfural and other furanic compounds in many food types has been a concern lately. Furanic compounds such as furan and 5-hydroxymethylfuran had been detected to be harmful to human health. In this study the presence of furfural in baby food sample was analysed using solid phase microextraction (SPME) and gas chromatography mass spectrometry (GC-MS). The analysis used 5 types of baby food samples with different flavours which are apple purée, pear purée, pear and banana purée, carrot, parsnip and sweet potato purée, and peas and zucchini purée. The optimum conditions for SPME extraction were obtained. The optimum temperature was at 40°C while the optimum extraction time was at 30 minutes. The finding in this study showed that apple purée has the highest average furfural peak area value of 1.614×10^9 compared to other samples. Pear and banana purée placed second with peak area of 1.115×10^9 while pear purée was only slightly different from pear and banana purée with value of 1.108×10^9. Carrot, parsnip and sweet potato purée had the lowest average peak area with value of 0.018×10^9. Meanwhile peas and zucchini purée did not show any presence of furfural using the optimum conditions in this study.

CHAPTER 1

INTRODUCTION

1.1 Background of study

Food may contain mixtures of thousands of individual chemicals that consist of a variety of characteristics, including texture, flavour, colour, and nutritive value. Therefore, human may be exposed to the health risks from the consumption of the specific food chemicals. There are two types of chemical that can be found in food that are natural contaminants and intentionally introduced contaminants. The main problem posed by natural contaminants is due to the fact that their existence and toxicity can only be suspected following an occurrence of massive poisoning (Massin, 2010). Vranová and Ciesarová (2009) stated that furan is a naturally occurring compounds found at very low levels in many foods and drinks. Furan have been associated with the flavour of foods.

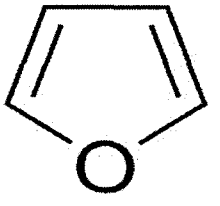

Figure 1.1: Chemical structure of furan.

Furan (C_4H_4O) as in Figure 1.1, is a colourless and highly volatile compound. It has boiling point of 31.3°C and density of 936.00 kg/m^3. This heterocyclic organic