



Simultaneous Detection of Pb(II) and Cd(II) Ions in Noodle Soup Samples Using Square Wave Anodic Stripping Voltammetry

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ABSTRACT

Noodles are a favorite food in many cultures. There are many cases that noodle soups were contaminated with heavy metal like Pb(II) and Cd(II) which released from their container or boiling pot. In this work, the highly selective method has been established for simultaneous detection of Pb(II) and Cd(II) ions using bismuth film electrode by applying square wave anodic stripping voltammetry or SWASV technique. Bi(III) ion was used to enhance analytical signal by *in situ* plating solutions on glassy carbon support. The electrochemical analysis is based on simultaneous preconcentration/reduction of both ions at -1.1 V (versus Ag/AgCl) in 0.5 molL⁻¹ HCl during 240 s, followed by subsequent chemical stripping of square-wave detection. The linear calibration curve was exhibited in the ranged of 0.02-1.0 mgL⁻¹. The value of limits of detection (LOD) for Pb(II) and Cd(II) were attained at 0.007 mgL⁻¹ and 0.004 mgL⁻¹. The developed method was successfully used to simultaneous determine Pb(II) and Cd(II) ions in noodle soup samples from noodle shops in Nakhon Si Thammarat Province, Thailand. The recoveries were in the range 83-109%. The present method provides highly selective detection for determination of both Pb(II) and Cd(II) ions.

Keywords: Lead(II), Cadmium(II), Voltammetry, Noodle soup samples.

INTRODUCTION

Noodles are a staple food in many countries. They are cooked in boiling water, sometimes with cooking oil or salt added. When their container contact with food, the impurities may transfer into the food. Particularly, Pb(II) and Cd(II) are known to be high toxic metals to not only aquatic life but also human¹. They could accumulate via food chain

which cause harm to human health. Hence, the development technique for determination of both ions in noodle soups samples is very significance for not only the human safety but also pollution control². Recently, several analytical techniques have been used to determine the quantity of Pb(II) and Cd(II) ions in various samples such as spectrometry techniques (AAS, ICP, UV-Vis), chromatography technique (HPLC) and liquid ion exchange³⁻¹¹.

