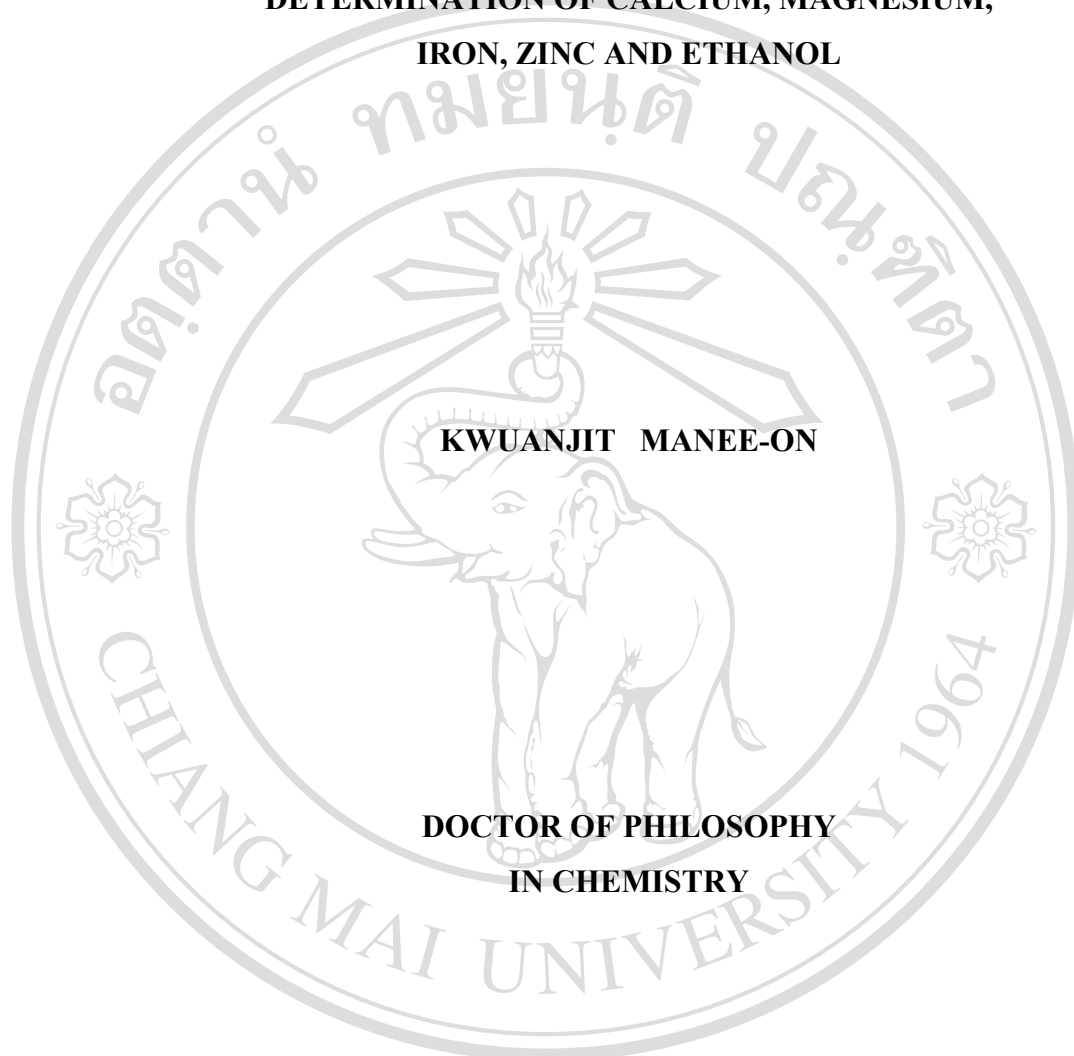


**DEVELOPMENT OF FLOW INJECTION PROCEDURES FOR THE  
DETERMINATION OF CALCIUM, MAGNESIUM,  
IRON, ZINC AND ETHANOL**



**KWUANJIT MANEE-ON**

**DOCTOR OF PHILOSOPHY  
IN CHEMISTRY**

**ลิขสิทธิ์มหาวิทยาลัยเชียงใหม่**

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**GRADUATE SCHOOL  
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**A THESIS SUBMITTED TO THE GRADUATE SCHOOL IN  
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FOR THE DEGREE OF  
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28 March 2005

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*Kwuanjit Manee-on*

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## THE RELEVANCE OF THE RESEARCH WORK TO THAILAND

This research work concerns the development of two flow injection procedures. The first FI one was developed by using simple and common reagents (Mg-EDTA and EBT) for the determination of Ca(II), Mg(II), Fe(II), and Zn(II). The proposed procedure is low cost, simple and rapid. This is very useful to Thailand and other developing countries. The procedure can be used as an alternative economic method for the determination of Ca(II), Mg(II), Fe(II), and Zn(II) in drug and mineral supplement samples.

Another FI procedure was the determination of ethanol. It involved an on-line derivatization of ethanol into xanthate. A FI system was assembled. It included a laboratory made HMDE flow cell and a gas diffusion unit.

Other outputs from this research are two, analytical chemistry e-books describing the above two topics. This should be useful to follow the concepts and principles of complexometric titration and voltammetry.