

APPENDIX

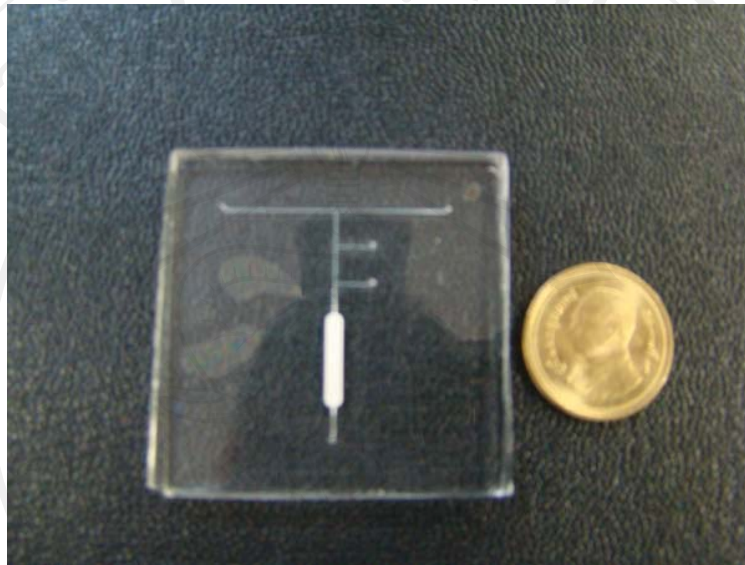


Figure A-1 CAP-MIP on microfluidic glass chip



Figure A-2 Chemiluminescence detector for the determination of chloramphenicol

METHOD VALIDATION AND QUALITY CONTROL PROCEDURES⁽¹⁷⁸⁾

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Table A-1 Validation parameters and criteria

Parameter	Criterion
Linearity	Through calibration curve Residuals $< \pm 20\%$
Matrix effect	Comparison of response from solvent standards and matrix-matched standards -
LOQ	By definition: lowest level for which it has been demonstrated that criteria for accuracy and precision have been met $\leq \text{MRL}$
Specification	Response in reagent blank and control samples $< 30\%$ of LOQ
Accuracy	Determine average recovery for both spike levels 70 - 120%
Precision (RSD_r)	Determine repeatability RSD_r , determine for both spike levels $\leq 20\%$
Precision (RSD_{WR})	Determine within-laboratory reproducibility $\leq 20\%$

CURRICULUM VITAE

Name Mr. Wisanu Thongchai

Date of Birth 6th July 1976

Academic Qualifications

- Ph. D. Student in Pharmacy, Faculty of Pharmacy, Chiang Mai University,
Chiang Mai, Thailand, 2005-2010.

Thesis Title: Development of Flow Injection Analysis Methods for the
Determination of Bioactive Compounds from Thai Medicinal
Plants and Drug Residue

Advisor: Assoc. Prof. Dr. Boonsom Liawruangrath
Department of Pharmaceutical Sciences, Faculty of Pharmacy,
Chiang Mai University

Co-advisor: Assoc. Prof. Dr. Saisunee Liawruangrath
Department of Chemistry, Faculty of Science,
Chiang Mai University

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Department of Chemistry, Faculty of Science,
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- M.Sc. Pharmaceutical Sciences, Faculty of Pharmacy, Chiang Mai University,
Chiang Mai, Thailand, 2005.

Thesis Title: Development of High Performance Liquid
Chromatographic Method for the Determination of Arbutin in
Creams and Medicinal Plant Extracts

Advisor: Assoc. Prof. Dr. Boonsom Liawruangrath

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Department of Chemistry Sciences, Faculty of Science, Chiang
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- B.Sc. Chemistry, Faculty of Science, Pibulsongkram Rajabhat University,
Phitsanulok, Thailand, 1999.

Special Problem (B.S.C): Determination of Lead in Printed Materials by
Atomic Absorption Spectrophotometer

Location of Ph.D. Research

- Department of Pharmaceutical Sciences, Faculty of Pharmacy, Chiang Mai
University
- Department of Chemistry Sciences, Faculty of Science, Chiang Mai University
- Department of Chemistry, Faculty of Science, The University of Hull, United
Kingdom

Practical Experiences

- Chemist, Science Center, Department of Chemistry, Faculty of Science and
Technology, Pibulsongkram Rajabhat University, Phitsanulok, Thailand, Oct
1999 – Apr 2001.
- Special Lecturer, Department of Chemistry, Faculty of Science and
Technology, Pibulsongkram Rajabhat University, Phitsanulok, Thailand, Oct
2001 – Apr 2002.
- Visiting Fellow, Department of Chemistry, The University of Hull, UK.
June 2008 – March 2009.

Awards/ Scholarships

- The Graduate School, Chiang Mai University, 2002.
- Faculty of Pharmacy, Chiang Mai University, 2002.
- The Royal Golden Jubilee Ph.D. Program (RGJ) from the Thailand Research Fund (TRF), 2007-2009.

Research Interests

1. New methods for quality control of drug, food, cosmetics and environmental.
2. Assay and validation method for bioactive compounds from medicinal plants.
3. New techniques for analysis

List of Publications

1. **W. Thongchai**, B. Liawruangrath, C. Thongpoon and T. Machan, High performance thin layer chromatographic method for the determination of diclofenac sodium in pharmaceutical formulations, *Chiang Mai J. Sci.* **33** (1) (2006), 123-128.
2. **W. Thongchai**, B. Liawruangrath and S. Liawruangrath, High performance liquid chromatographic determination of arbutin in skin whitening creams and medicinal plant extracts, *J. Cosmet. Sci.* **58** (2007), 35-44.
3. **W. Thongchai**, B. Liawruangrath and S. Liawruangrath, High performance liquid chromatographic determination of arbutin in skin whitening creams and medicinal plant extracts, *Int. J. Cosmet. Sci.* **29** (6) (2007), 488.
4. **W. Thongchai**, B. Liawruangrath and S. Liawruangrath, Arbutin determination in medicinal plants and creams, *Int. J. Cosmet. Sci.* **31** (2009), 87-96.
5. **W. Thongchai**, B. Liawruangrath and S. Liawruangrath, Flow injection analysis of total curcuminoids in turmeric and total antioxidant capacity using 2,2'-diphenyl-1-picrylhydrazyl assay, *Food Chemistry* **112** (2009), 494-499.

6. **W. Thongchai**, B. Liawruangrath and S. Liawruangrath, Sequential injection analysis with lab-at-valve (SI-LAV) for the determination of solasodine in *Solanum* species, *Talanta* **81** (2010), 565-571.
7. **W. Thongchai**, B. Liawruangrath, S. Liawruangrath and G.M. Greenway, A microflow chemiluminescence system for the determination of chloramphenicol in honey with preconcentration using a molecularly imprinted polymer, *Talanta*, Article in press, Accepted manuscript.

International Conferences;

1. **S. Liawruangrath**, B. Liawruangrath and Wisanu Thongchai, Flow injection analysis of arbutin, *International Conference on Flow Injection Analysis and Related Techniques (ICFIA) 14th*, Berlin, (02/09/2007).
2. **W. Thongchai**, B. Liawruangrath and S. Liawruangrath, Flow injection analysis of total curcuminoids in turmeric extracts, *RSC International Conference on Analytical Research Forum 2008*, University of Hull, United Kingdom, (21-23/06/2008)

National Conferences;

1. B. Liawruangrath, S. Liawruangrath and **W. Thongchai**, Determination of heavy metal contents contaminated in herbal drugs, *The Sixth Princess Chulabhorn International Science Congress*, 2007.
2. **W. Thongchai**, B. Liawruangrath and S. Liawruangrath, High-performance liquid chromatographic determination of arbutin in skin whitening creams and medicinal plant extracts, *The Sixth Princess Chulabhorn International Science Congress*, 2007.
3. **W. Thongchai**, B. Liawruangrath, D. Winijkul, S. Natakankikul, C. Thongpoon and T. Machan, Determination of Diclofenac Sodium by High Performance Thin Layer Chromatography, *The 30th Congress on Science and Technology of Thailand*, 2004.

4. B. Liawruangrath, S. Liawruangrath, **W. Thongchai** and T. Machan, Determination of malic Acid and Citric Acid in Ripe Berries of *Eugenia paniaia* Roxb. by High Performance Liquid Chromatography, *The 31st Congress on Science and Technology of Thailand*, 2005.
5. **W. Thongchai**, B. Liawruangrath, C. Chiyasut and P. Leelapornpisid, Determination of Arbutin in Skin-Whitening Cosmetics by High Performance Liquid Chromatography, *The 31st Congress on Science and Technology of Thailand*, 2005.
6. C. Thongpoon, B. Liawruangrath, S. Liawruangrath, T. Marchan and **W. Thongchai**, High Performance Liquid Chromatographic (HPLC) Method for the Determination of Cephalexin, Cefazolin and Cefoxitin, *The 32nd Congress on Science and Technology of Thailand*, 2006.
7. **W. Thongchai**, B. Liawruangrath, S. Liawruangrath, C. Thongpoon, S. Saysin, T. Marchan and C. Raweevan, Determination of Curcuminoid Contents by High Performance Liquid Chromatography, *The 32nd Congress on Science and Technology of Thailand*, 2006.
8. B. Liawruangrath, S. Liawruangrath, **W. Thongchai**, S. Saysin, P. Srisom, J. Chuangbunyat and T. Machan, Determination of Tetracyclin Residues in Milk and Milk Products by High Performance Liquid Chromatography, *The 32nd Congress on Science and Technology of Thailand*, 2006.
9. **W. Thongchai**, B. Liawruangrath, S. Liawruangrath, T. Marchan, S. Saysin, and C. Thongpoon, Determination of High Performance Liquid Chromatographic Method for the Determination of Solasodine, *The 33rd Congress on Science and Technology of Thailand*, 2007.
10. C. Thongpoon, **W. Thongchai** and T. Marchan Spectrophotometric method for the determination of amoxicillin in pharmaceutical formulations, *The 33rd Congress on Science and Technology of Thailand*, 2007.

11. T. Wonganan, S. Liawruangrath, B. Liawruangrath and **W. Thongchai**, Determination of Ascorbic Acid in Orange Juice by Differential Pulse Polarography, *The 34th Congress on Science and Technology of Thailand*, 2008.
12. **W. Thongchai**, B. Liawruangrath and S. Liawruangrath, Flow injection analysis of total curcuminoids in turmeric and total antioxidant capacity using 2,2'-diphenyl-1-picrylhydrazyl assay, *Research for better for better life quality: Symposium on flow based analysis*, 2009.
13. B. Liawruangrath, S. Liawruangrath, **W. Thongchai** and S. Saysin, High Performance Thin Layer Chromatographic Determination of Erythromycin in Pharmaceutical Preparations, *The 35th Congress on Science and Technology of Thailand*, 2009.
14. **W. Thongchai**, B. Liawruangrath and S. Liawruangrath, Determination of Chloramphenicol Residue in Honey and Milk Samples based on Molecularly Imprinted Polymer, *The 35th Congress on Science and Technology of Thailand*, 2009.
15. **W. Thongchai**, B. Liawruangrath, S. Liawruangrath and S. Saysin, High performance liquid chromatographic method for the determination of solasodine in *solanum* species, *PACCON conference*, 2010.

LIST OF PUBLICATIONS

1. **W. Thongchai**, B. Liawruangrath and S. Liawruangrath, Arbutin determination in medicinal plants and creams, *International Journal of Cosmetic Science* **31** (2009) 87-96. (Impact Factor; 0.837)
2. **W. Thongchai**, B. Liawruangrath and S. Liawruangrath, Flow injection analysis of total curcuminoids in turmeric and total antioxidant capacity using 2, 2'-diphenyl-1-picrylhydrazyl assay, *Food Chemistry* **112** (2009) 494-499. (Impact Factor; 3.183)
3. **W. Thongchai**, B. Liawruangrath and S. Liawruangrath, Sequential injection analysis with lab-at-valve (SI-LAV) for the determination of solasodine in Solanum species, *Talanta* **81** (2010), 565-571. (Impact Factor; 3.206)
4. **W. Thongchai**, B. Liawruangrath, S. Liawruangrath and G.M. Greenway, A microflow chemiluminescence system for the determination of chloramphenicol in honey with preconcentration using a molecularly imprinted polymer, *Talanta*, Article in press, Accepted manuscript. (Impact Factor; 3.206)