

Graduate Student Recruitment and Training Support

Report for

One Ajahn, One Project

May 2003 through April 2004

Academic Year 2546

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My project was titled "Graduate Student Recruitment Support", and had the goal of attending an International Conference in chemistry or crystallography, accompanied by at least one SUT graduate student, to make presentations related to the research my group is working on at SUT. During the year, our research was presented at five international conferences and two domestic conferences. Four of my SUT students presented papers at international, and five of my SUT students presented papers at domestic conferences. I visited Mahidol University and Burapha University for recruitment purposes.

Results:

I. Attended three International Conferences and represented at two others.

- a. Attended the AsCA'03, the joint meeting of the Asian Crystallographic Association and the Society of Crystallographers of Australia and New Zealand held in Broome, Australia 10-13 August 2003

Accompanying student: Weenawan Somphon.

Financial support for partial payment of expenses from TRF-RGJ.

- i. Represented Thailand at the 2003 Executive Committee meeting of the Asian Crystallographic Association (AsCA).
 - ii. Attended the special workshop, accompanied by Ms. Weenawan Somphon, on *Twinning*, a specialized topic that is part of her research project..
 - iii. Visited the Research School of Chemistry, The Australian National University in Canberra, Australia, accompanied by one student, Weenawan Somphon.
- b. Attended the joint meeting of the Tenth Asian Chemical Conference, ACC-10, and the Eighth Eurasia Conference on Chemical Science, EuAsC₂S-8, Hanoi, Vietnam, 21-24 October 2003. (attached documents: 3 abstracts, 4 pages)

Accompanying student: Preeyaporn Pookrod.

Financial support for payment of the student's expenses from TRF-RGJ.

- iv. "Arsenic Removal using Polyelectrolyte-Enhanced Ultrafiltration", (Preeyaporn Pookrod; Kenneth J. Haller; John F. Scamehorn) Tenth Asian Chemical Conference, ACC-10, Hanoi, Vietnam, in Symposium I, Environmental Chemistry, 15:40-16:00, program page 6, abstract page 167, 21-24 October 2003.
 - v. "Precipitation of Barium Arsenate in the Presence of Cationic Polyelectrolyte", (Kenneth J. Haller; Preeyaporn Pookrod; John F. Scamehorn) Tenth Asian Chemical Conference, ACC-10, Hanoi, Vietnam, in Symposium I, Environmental Chemistry, 15:20-15:40, program page 6, abstract page 166, 21-24 October 2003.
 - vi. "Supramolecular Structure of [Cd(bpa)₂(NO₃)₂]_n, bpa=1,2-bis(4-bipyridyl)ethane", (Weenawan Somphon; Kenneth J. Haller) Tenth Asian Chemical Conference, ACC-10, Hanoi, Vietnam, abstract AP078, 21-24 October 2003.
 - vii. Visited the Petrochemical and Catalysis Material Laboratory, Faculty of Chemical Technology, Hanoi University of Technology: hoping for collaborative links to follow from this visit (we have started a pilot project for which we have submitted an abstract for presentation at the Asian Crystallographic Association meeting, AsCA'04, in Hong Kong in June 2004) as well as potential student recruits from this source.
- c. Attended the 227th National Meeting of the American Chemical Society held in Anaheim CA, USA, 28 March 2004-1 April 2004. (attached documents: 2 pages)

Accompanying student: Winya Dungkaew.

Financial support for partial payment of expenses from TRF-RGJ.

- viii. "Phase Diagram from Barium Arsenate Precipitation in the Absence and Presence of Polyelectrolyte". (with Winya Dungkaew, John F. Scamehorn, Adrian E. Flood), American Chemical Society, 227th National Meeting, Division of Colloid and Surface Chemistry, Los Angeles, USA, March 28-April 1, 2004.
- ix. "Precipitation of Arsenate with Copper(II) in the Presence of Cationic Polyelectrolyte", (with

Preeyaporn Pookrod, John F. Scamehorn), American Chemical Society, 227th National Meeting, Division of Colloid and Surface Chemistry, Los Angeles, USA: Abstract, March 28-April 1, 2004.

- x. Visited the Chemical Engineering and Materials Science Department, The University of Oklahoma in Norman, Oklahoma, accompanied by one student, Winya Dungkaew.
- d. Sent one student to The Tenth Triuniversity Conference, Mia University, Japan: October 2003. (attached document: 6 pages)
Student: Kittipong Chainok.
Financial support from the conference organizers.
 - xi. "Hydrothermal Synthesis and Characterization of a Microporous Cobalt Vanadium Oxide Framework Compound", (with Kittipong Chainok) Tenth Triuniversity Conference, Mia University, Japan, 18-21 October 2003.
- e. Represented at the 226th National Meeting of the American Chemical Society held in New York NY, USA, September 2003. (attached document: 1 page)
Represented by Prof. John F. Scamehorn, presenting work of Preeyaporn Pookrod.
 - xii. "Removal of Arsenic Anions From Water Using Polyelectrolyte-Enhanced Ultrafiltration", (with John F. Scamehorn, Preeyaporn Pookrod) 226th American Chemical Society National Meeting, New York NY, USA, September 2003, paper #634642.

II. Attended one National Conference and represented at one other.

- f. Royal Golden Jubilee PhD Congress V held in Pattaya (attached document: 1 page)
Accompanying students: Weenawan Somphon and Samroeng Krachodnok.
 - xiii. "The Ordered Twin to Disordered Phase Transition in Modulated $[Ag(bipy)NO_3]_n$ ", (with Weenawan Somphon, A. David Rae), Royal Golden Jubilee PhD Congress V, Pattaya, Thailand, April 23-25, 2004.
- g. Represented at the 29th Congress on Science and Technology of Thailand, held at Khonkaen, 20-22 October 2003. (attached documents: 4 pages)
Attending students: Samroeng Krachodnok, Nongnaphat Khosavithikul, Winya Dungkeaw, Angkana Kiatpichitpong.
 - xiv. "Hydrothermal Synthesis and Characterization of a Cobalt Vanadium Oxide Compound", (with Samroeng Krachodnok, Kittipong Chainok), 29th Congress on Science and Technology of Thailand, Khon Kaen, Thailand, 20-22 October 2003.
 - xv. "Phase Diagram of Barium Arsenate", (with Winya Dungkeaw), 29th Congress on Science and Technology of Thailand, Khon Kaen, Thailand, 20-22 October 2003.
 - xvi. "Synthesis and Characterization of Four-Coordinate Azidonitrosylbis(triphenyl-phosphine) Nickel", (with Nongnaphat Khosavithikul), 29th Congress on Science and Technology of Thailand, Khon Kaen, Thailand, 20-22 October 2003.
 - xvii. "Structure of a Rigid Hexaaza Cage Cobalt(III) Dichloride Perchlorate", (with Angkana Kiatpichitpong, Glen W. Walker, Rodney J. Geue, A. David Rae, Alan M. Sargeson) 29th Congress on Science and Technology of Thailand, Khon Kaen, Thailand, 20-22 October 2003.

III. Gave one invited seminar on graduate research from the Arsenic projects.

- h. Mahidol University International College Seminar Series. 17 March 2004..
 - xviii. "The Ordered Twin to Disordered Phase Transition in Modulated $[Ag(bipy)NO_3]_n$ ", Mahidol University International College seminar series, Salaya Campus, Nakhon Phatom, Thailand, 17 March 2004.

V. Invited Prof. Oliver Ileperuma, Department of Chemistry, University of Sri Lanka, Peradeniya Campus, Kandy, Sri Lanka to give a seminar at SUT.

- i. Prof. Ileperuma gave a quite interesting seminar on gel based solar conversion materials.
- j. Prof. Ileperuma and I held discussions on the possibilities for recruiting Sri Lankan students to SUT and on possibilities for exchanging graduate students between our two research groups to enhance the graduate experience for all our students.
- k. Prof. Ileperuma engaged in discussion with my graduate students, and toured our instrument and laboratory facilities..

VI. Results on some individual students recruited.

- l. Ms. Sasikarn Endoo, B.Sc. degree in Industrial Chemistry from KMIT-NB, Ms. Sasikarn initially committed to become a research assistant in my group and apply to be an M.Sc. student, but had also applied to Chulalongkorn University. Chula subsequently accepted her and she declined to come to SUT..
- m. Ms. Ulanka Udomthada, B.Sc. degree in Industrial Chemistry, KMIT-NB, Ms. Ulanka is a close friend of Sasikarn (above). When Sasikarn decided to go to Chulalongkorn University, Ms. Ulanka decided to follow her friend, and consequently she declined to apply to SUT, and also declined to accept a research assistant position.
- n. Ms. Ratchadaporn Puntharod, M.Sc. degree from Chiangmai University, is a faculty member at Meijo University. Her department has three members studying overseas. Ms. Ratchadaporn is scheduled to come to SUT when the first of these returns (expected during Term 2/2547).
- o. Ms. Panada Tansupo, M.Sc. in Chemistry from Khonkaen University. Reports she needs money and will work for at least one year. I will contact her again next year.
- p. Ms. Uthaiwan Sirion, M.Sc. in Chemistry from Burapha University. Ms. Uthaiwan received an award to study in Korea and consequently will not be applying to SUT in 2547.
- q. Mr. Ngo Xuan Dong B.Sc. in Chemistry from Hanoi University of Technology (contact from activity b-vii above). Mr. Dong is a fourth year undergraduate student this year. He is considering applying to SUT next year..

Attachments List:

- Three abstracts from the joint meeting of the Tenth Asian Chemical Conference, ACC-10, and the Eighth European-Asian Chemical Conference, Hanoi, Vietnam, 21-24 October 2003.
- One abstract submitted to the Asian Crystallographic Association meeting, AsCA'04, to be held in Hong Kong in 27-30 June 2004.
- Two abstracts from the 227th National Meeting of the American Chemical Society held in Anaheim CA, USA, 28 March 2004-1 April 2004.
- One conference proceedings (four pages) from the Tenth Triuniversity Conference, Mia University, Japan, October 2003.
- One abstract from the 226th National Meeting of the American Chemical Society held in New York NY, USA, September 2003.
- One abstract from the Fifth Royal Golden Jubilee PhD Congress held in Pattaya, 23-25 April 2004.
- Four abstracts from the 29th Congress on Science and Technology of Thailand, held at Khon Kaen, 20-22 October 2003.
- One abstract from the presentation at Mahidol University International College Seminar Series, 17 March 2004.

**10th Asian Chemical Congress
10 ACC**

**8th Eurasia Conference
on Chemical Sciences
EuAsC₂S-8**

BOOK OF ABSTRACTS

October 21-24, 2003,
Hanoi, Viet Nam



CHEMICAL SOCIETY OF VIETNAM

Presented at the joint meeting of the Tenth Asian Chemical Conference, ACC-10, and the Eighth Eurasia Conference on Chemical Science, EuAsC₂S-8, Hanoi, Vietnam, 21-24 October 2003.

ARSENIC REMOVAL USING POLYELECTROLYTE- ENHANCED ULTRAFILTRATION

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Polyelectrolyte-enhanced ultrafiltration (PEUF), using cationic poly(diallyldimethyl ammonium chloride) polyelectrolyte was used to investigate the removal of arsenic(V) from dilute aqueous solutions (1). In PEUF a water-soluble polyelectrolyte of opposite charge to that of the target ion binds the charged arsenate complex. The solution is then treated by ultrafiltration with membrane pore sizes small enough to block the polymer. Only the residual unbound arsenate at the concentration in the retentate (solution not passing through membrane) is present in the permeate solution passing through the membrane. Arsenic rejections as high as 99.95% are obtained and increase with increasing polymer concentration and decrease with increasing ionic strength (added salt concentration). Arsenic rejection increases with increasing pH (pH of 6.5 to 8.5) as the $\text{HAsO}_4^{2-}/\text{H}_2\text{AsO}_4$ ratio in solution increases, improving arsenate binding to the polymer. Gel point concentration (polymer concentration at which flux becomes zero) was found to be 655 to 665 mM, (approximately 5.98 to 6.07 wt%) consistent with previous PEUF studies. These high gel points mean that high water recoveries (>99%) are achievable in this separation process.

1. Pookrod, P.; Haller, K. J.; Scamehorn, J. F.; Sep. Sci. Technol. 2003, accepted.