汪 上 曉 教授

DAVID SHAN-HILL WONG, PROFESSOR

- 美國加州理工學院　學士，民國六十七年
- 美國德拉威大學　碩士，民國七十年
- 美國德拉威大學　博士，民國七十一年

- B.S. California Institute of Technology, USA, 1978
- M.S. University of Delaware, USA, 1981
- Ph.D. University of Delaware, USA, 1982

主要研究領域

今日化學製程系統工程師之主要工作除了針對傳統化學製程改善產品品質、提高能源效率及減低環境衝擊，還需要開發各類新興產業如半導體、光電、生物科技之製程。對傳統化學製程而言，我們已習慣使用以質能守恆結算、輸送現象、熱力學及動力學為基礎之理論模式進行模擬，探討製程之最適化及控制；對較為新穎之製程及產品之開發，則必須使用統計方法配合定性之知識建立經驗模式。本實驗室之研究重點為利用統計、數學、系統工程理論、及電腦科技結合物理、化學及生物知識發展系統模式，作為開發高效製程及優質產品之用；目前的幾個主題為：半導體製程之高階控制、整合精餾及二氧化碳捕捉製程之設計及控制、及系統生物學。

Main Research Interests

Today, in addition to making the traditional chemical process more energy efficient and environmentally benign, chemical process system engineers are also facing challenges in design and development of novel products and processes in various newly developed industries such as semi-conductor manufacturing, opto-electronic materials, biotechnology. While first principle modeling is very useful in the simulation, design and control of traditional chemical processes, statistical techniques must be employed to study novel processes and products. Our laboratory focuses on the use of statistics and mathematics tools together with physics, chemistry and biology knowledge to develop models and the application of such models to obtain efficient processes and quality products. Current topics include advanced process control in semi-conductor manufacturing, design and control of heat integrated distillation and carbon dioxide capture processes, and system biology.

代表作 (Selected Publications)

- Liu, J.-L., Gao, H.-C., Peng, C.-C., **Wong, D.-S.-H.***, Jang, S.-S., Shen, J.-F., "Aspen Plus rate-based modeling for reconciling laboratory scale and pilot scale CO_2 absorption using aqueous ammonia," International Journal of Greenhouse Gas Control, Vol. 34, 117-128, 2015.
- Liu, J.-L. *, **Wong, D.-S.-H.**, Chen, D.-S., "Bayesian filtering of the smearing effect: Fault isolation in chemical process monitoring," Journal of Process Control, Vol. 24(3), 1-21, 2014.
- Lin, C.-H., **Wong, D.-S.-H.***, Lu, S.-Y., "Layered Protonated Titanate Nanosheets Synthesized with a Simple One-Step, Low-Temperature, Urea-Modulated Method as an Effective Pollutant Adsorbent," ACS Applied Materials & Interfaces, Vol. 6(19), 16669-16678, 2014.
- Wang S.-J.*, **Wong, D.-S.-H.**, "Online switching of entrainers for acetic acid dehydration by heterogeneous azeotropic distillation," Journal of Process Control, Vol. 23(1), 78-88, 2013.
- Lin, Y.-J., **Wong, D.-S.-H.***, Jang, S.-S.*, Ou, J.-J., "Control strategies for flexible operation of power plant with CO_2 capture plant," AICHE J., Vol. 58(9), 2697-2704, 2012.