

Yushan Zhu



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Educational Background:

1993, B.E., Chemical Engineering, Tianjin University, China.

1996, M.E., Chemical Engineering, Tianjin University, China.

1999, Ph.D., Chemical Engineering, Chinese Academy of Sciences.

Research Background:

April, 2001~March, 2003, JSPS Postdoctoral Fellow, University of Tsukuba, Tsukuba, Japan.

Professional Experiences:

April, 2003 ~ March, 2004, Researcher, National Institute of Advanced Industrial Science and Technology, Tsukuba Central-5, Japan.

April, 2004 ~ Present, Associate Professor, Department of Chemical engineering, Tsinghua University, China.

Teaching:

<Optimization of Chemical Processes>for undergraduate students (Junior, Spring Semester

As Reviewer for International Journals:

- 1) Chemical Engineering and Processing,
- 2) Journal of the Operations Research Society of Japan,
- 3) Journal of Membrane Science.
- 4) Industrial & Engineering Chemistry Research.

Research fields:

- 1) Mixed-integer optimization based chemical process integration and control structure selection;
- 2) Large-scale deterministic global optimization based chemical and biological product design;
- 3) Mathematical programming based scheduling and operations management for chemical processes;
- 4) Computational protein design;
- 5) High-throughput virtual screening for drug discovery.

Representative publications:

- 1) Zhu, Y. & T. Kuno. "A disjunctive cutting plane based branch-and-cut algorithm for 0-1 mixed-integer nonlinear programs". Industrial & Engineering Chemistry Research. 45: 187-196. (2006).
- 2) Zhu, Y. & T.Kuno. "A global optimization method, QBB, for twice-differentiable nonconvex

optimization problem”. *Journal of Global Optimization*, 33: 435-464 (2005).

3) Zhu, Y. & T. Kuno. “Global optimization of nonconvex MINLP by a hybrid branch-and-bound and revised general Benders decomposition method”, *Industrial & Engineering Chemistry Research*, 42: 528-539. (2003).

4) Zhu, Y. & K. Inoue. “Calculation of chemical and phase equilibrium based on the stability analysis by using a general branch and bound global optimization algorithm QBB: Application to NRTL equation”, *Chemical Engineering Science*, 56: 6915-6931. (2001).

5) Zhu, Y., H. Wen, Z. Xu. “Global stability analysis and phase equilibrium calculations at high pressures using the enhanced simulated annealing algorithm”, *Chemical Engineering Science*, 55: 3451-3459. (2000).

6) Zhu, Y. & Z. Xu. “Calculation of liquid-liquid equilibrium based on the global stability analysis for ternary mixtures by using a novel branch and bound algorithm: application to UNIQUAC equation”, *Industrial & Engineering Chemistry Research*, 38 (9): 3549-3556. (1999).

7) Zhu, Y. & Z. Xu. “A reliable prediction of the global phase stability for liquid-liquid equilibrium through the simulated annealing algorithm: Application to NRTL and UNIQUAC equations”, *Fluid Phase Equilibria*, 154: 55-69. (1999).

8) Zhu, Y. & H. Chen. “Pervaporation separation and pervaporation-esterification coupling using crosslinked PVA composite catalytic membranes on porous ceramic plate”, *Journal of membrane science*, 138: 123-134. (1998).