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**Education:** Bachelor of Engineering, Zhejiang University, P.R.China  
1984-1988

Master of Engineering, Chinese Academy of Forestry 1988-1991

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### **Experience:**

- Worked as Assistant Engineer (Sept. 1991--July 1994), Engineer (August 1994--July 1998), Associate Professor and senior engineer (Aug. 1998 to 2001) in Research Institute of Chemical Processing and Utilization of Forest Products, Chinese Academy of Forestry, Nanjing, China

- Worked as Engineer (Sept. 1991--Dec. 1997) in Wuxi County Spray Dryer Factory, Jiangsu Province, China,

- Worked as Head of technical department (Jan. 1998--Feb. 1999), Manager of Engineering Department, Mar. 1999 to Dec. 2001, Linzhou Dryer Factory, Jiangsu Province, China

- Member, Group on Drying Technology (Sept. 1999 to present) in Chinese Chemical Engineering Society

**Research area:** Computational fluid dynamics, spray drying, fluid bed drying, mass and heat transfer

### **Research project** (for PhD in NUS):

Title: Novel spray dryer configurations: simulation studies

Started: Jan./2002      Expected date of completion: Dec./2004

### **Summary of project objectives**

(1) Develop and validate a CFD-based model to predict flow patterns and overall drying performance of a conventional cylinder-on-cone spray dryer by comparing the results with published results as well as new data to be supplied by collaborating researchers in Norway, Australia, Denmark, India etc.

(2). Evaluate novel spray dryer chamber geometries that yield better volumetric effectiveness and higher heat/mass transfer performance than the conventional designs, The geometries being considered are: cone-on-cone, purely conical, hour-glass shape and lantern shape changers. Both axi-symmetric and fully 3 dimensional versions are being considered

(3) Evaluate a new two-stage, two dimensional horizontal spray dryer concept proposed by Prof. Mujumdar which is expected to allow long drying times needed for heat-sensitive products and large droplet sizes. This requires a CFD spray dryer model which will be coupled to a deep bed drying model to be developed separately.

(4) Develop a new FORTRAN program to simulate the spray drying process. Through this program, detail information about spray droplets can be obtained. The interactions between wall and droplets are considered dependent on the droplet conditions.

## **Publications:**

### **(a) Chapter in book**

(1) Huang Lixin, et al., 1994, Study on dynamic properties of high-speed centrifugal atomizer. In 'Study on technology of protection atmosphere from being polluted', Environmental Protection Bureau of China ed., Science Publication House: Beijing, pp.454-464.

### **(b) Papers in Journal (Partial list)**

(1) Huang Lixin, et al, Computer-aided design of centrifugal spray dryer, Journal of Nanjing Forestry University, 1997, vol.21, no.3, add:68-71, (Nanjing, China)(in Chinese)

(2) Huang Lixin, et al, Study on energy-saving technology of spray drying. Journal of chemical industry of forest products, 2001, vol.35, No.1, pp 3-5.,(Nanjing, China)(in Chinese)

(3) Huang Lixin, et al, Study on drying CPE in S-shape continuous fixed fluidized bed dryer. Journal of Nanjing Forestry University, 2001, Vol.25, No.3, pp45-48, (Nanjing, China)(in Chinese)

(4) Huang Lixin, et al, Research of vibration property of vibrated fluidized bed. Chemistry and industry of forest products, 1997, Vol.7, No.2, pp58-62, (Nanjing, China) (in Chinese)

(5) Huang Lixin et al, Study on new technology of zero pollution discharge in treating papermaking extracted waste liquor, 2001, Engineering Science of China, Vol.3, No.10, pp72-76 (Beijing, China) (in Chinese)

(6) Huang Lixin et al., Recent progress of spray drying in China, Chemical Engineering (Xi'an, China), 2001, Vol. 29, No.2, pp51-55

(7) Huang, L., Kumar, K. and Mujumdar, A.S., 2003, Use of Computational Fluid Dynamics to Evaluate Alternative Spray Chamber Configurations, *Drying Technology*, 21(3), pp385-412

(8) Huang, L, Kumar, k and Mujumdar, A.S., 2003, A Parametric Study of the Gas Flow Patterns and Drying Performance of Co-current Spray Dryer: Results of a Computational Fluid Dynamics Study, *Drying Technology*, Vol.21, No.6 (in Press)

(9) Huang, L, Kumar, k and Mujumdar, A.S., 2003, Spray evaporation of different liquids in a drying chamber- Effect on flow, heat and mass transfer performance, *Chinese Journal of Chemical Engineering (English Version)* (Submitted)

### **(c) Paper in Conferences**

(1) Huang Lixin et al, 1997, Exploration on technological parameters in spray drying of pulping waste liquor. Chemistry and industry of forest products, 5<sup>th</sup> Chinese Drying Conference, Wuxi, P.R. China

(2) Huang Lixin et al., Spray drying encapsulation technology in food and pharmaceuticals, 2000 Annual conference on Enzymes, Beijing, China, pp66-69

(3) Huang, L., Kumar, K. And Mujumdar, A.S., 2003, Numerical Experiments with evaporation of water droplets in a Mixed Flow Spray chamber, 2<sup>nd</sup> Nordic Drying Conference, Copenhagen, Denmark, 25-27/Jun/2003 (Submitted and accepted)

(4) Huang, L, Kumar, k and Mujumdar, A.S., 2003, Effects of Air Infiltration and Heat Losses on Spray Evaporation in a Cylinder-on-cone Spray Dryer Chamber, 3<sup>rd</sup> Asia-Pacific Drying Conference, Bangkok, Thailand, 1-3/Sept./2003 (Submitted and accepted)

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