

## ***Publications of Dr. Arun Mujumdar (Partial list 2003-2004)***

### **1. Publications in refereed journals**

#### **2004**

- Zhao, W., Kumar, K. and Mujumdar, A.S., Flow and heat transfer under confined noncircular turbulent impinging jets, *Drying Technology*, Vol. 22, No.10, 2004
- Sablani, S.S., Kacimov, A., Mujumdar, A.S., Perret, J. and Campo, A., Non-iterative estimation of the heat transfer using an artificial neural network model, *International Journal of Heat and Mass Transfer*, Nov. 2004, In Press.
- Devahastin, S., Suvarnakuta, P., Soponsonnarit, S. And Mujumdar, A.S., A comparative study of low-pressure superheated steam and vacuum drying of heat-sensitive materials, *Drying Technology*, vol. 22, No8, 2004
- Rajan, R., Irudayaraj, J., Reddy, J.N. and Mujumdar, A.S., Finite element simulation and validation of stepwise drying of banana, *Numerical Heat Transfer-B*, Accepted October 2003
- Mujumdar, A.S., Research and Developments in Drying: Recent Trends and Future Prospects, *Drying Technology*, volume 22, No. 1-2, pp. 1-26, 2004
- Ogura, H., Hamaguchi, N. Kage, H. And Mujumdar, A.S. Energy and cost estimation: application of chemical heat pump dryer to industrial ceramic drying, *Drying Technology*, Vol. 22, No. 1-2, pp. 307-323, 2004
- Zhao, L. J., Pan, Y. K. ,Li, J. G., Chen, G.H. and Mujumdar, A.S., Revolving flow fluidized bed dryer of inert particles, *Drying Technology*, volume 22, No.1-2, pp. 363-376, 2004
- Markowski, A.S. and Mujumdar, A.S., Drying risk assessment strategies, *Drying Technology*, vol. 22, No. 1-2, pp. 495-412, 2004.
- Hee, J.P., Kumar, K., Hock, S.C. and Mujumdar, A.S., Heat transfer from a laminar impinging jet of a power law fluid, *International Communications in Heat and Mass Transfer*, Vol. 31, No. 2: 241-249, 2004.
- Shi, Y.L., Mujumdar, A.S. and Ray, M.B., Effect of large temperature difference on impingement heat transfer under a round turbulent jet, *International Communications in Heat and Mass Transfer*, vol. 31, No. 2, 251-260, 2004.
- Huang, Lixin, Kumar, K and Mujumdar, A.S., Spray evaporation of different liquids in a drying chamber- Effect on flow, heat and mass transfer performance, *China Journal of Chemical Engineering (English Version)*, 2004. (Accepted)
- Huang, Lixin, Kumar, K. and Mujumdar, A.S., Simulation of Spray Evaporation using Pressure and Ultrasonic Atomizer – a Comparative Analysis, *Russian TSTU Trans (English Version)*, 10(1), pp83-100, 2004.

- Zhao, L., Pan, Y., Li, J., Chen, G. and Mujumdar, A.S., Drying of Dilute Suspension in a Revolving Flow Fluidized Bed of Inert Particles, *Drying Technology – An International Journal*, 22 (1&2), 363-376, 2004.
- Wang, X.Q., Yap, C. and Mujumdar, A.S., Effects of Two-Dimensional Roughness in Flow in Microchannels, *Journal of Electronic Packaging*, 2004. (accepted)
- Huang, L., Kumar, K. and Mujumdar, A.S., Simulation of a spray dryer fitted with a rotating disc using a three-dimensional computational fluid dynamic model, *Drying technology*, 22(6), 2004. (in press)
- Huang, L. and Mujumdar, A.S., Development of a new innovative horizontal spray dryer via mathematical model, *Drying technology*, 2005. (submitted)
- Huang, L., Kumar, K. and Mujumdar, A.S., A Comparative Study of A Spray Dryer with Rotary Disc Atomizer and Pressure Nozzle Using Computational Fluid Dynamic Simulations, *Chem. Engg. & Proc.*, 2004. (submitted)
- Sun, Lan, Islam, Md. Raisul, Ho, J.C. and Mujumdar, A.S., A diffusion model for drying of a heat sensitive solid under multiple heat input modes, *Bioresource Technology*, 2004. (submitted)
- Huang, L. and Mujumdar, A.S., A parametric study of an industrial spray dryer for coffee using computational fluid dynamic simulation, *Indu. Engg. Chem. Res.*, 2004. (being prepared)
- Suvarnakuta, P., Devahastin, S., Soponronnarit, S., Mujumdar, A.S., Drying Kinetics and Inversion Temperature in a Low-Pressure Superheated Steam Drying System, *Industrial & Engineering Chemistry Research*, 2004. (submitted)
- Mukesh Goel, Hu Hongqiang, Arun S. Mujumdar and Madhumita Bhowmick Ray, Sonochemical Decomposition of Volatile and Non-volatile Organic Compounds – A Comparative Study, submitted to *Water Research*, 2004. (in press)
- Wang, S.J., Devahastin, S., Mujumdar, A.S., Effect of Temperature Difference on Flow and Mixing Characteristics of Laminar Confined Opposing Jets, *Applied Mathematical Modeling*, 2004. (submitted)
- Wang, X.Q., Yap, C. and Mujumdar, A.S., Heat Transfer in Melting and Solidification of PCMs Contained in a Vertical Two-Dimensional Container with Horizontal Partitions, *International Communication of Heat & Mass Transfer*, 2004. (submitted)
- Wang, S.J., Devahastin, S., Mujumdar, A.S., A Numerical Investigation of Approaches to Improve Mixing Under Laminar Confined Impinging Streams, *Applied Thermal Engineering*, 2004. (accepted)

- Li, J., Zhao, L., Pan, Y.K., Chen, G. and Mujumdar, A. S. Fluidized-Bed Drying of Biological Materials: Two Cases Studies, Chinese Journal of Chemical Engineering, 2004. (accepted)
- Hu Hongqiang, Arun S. Mujumdar and Madhumita Bhowmick Ray, Degradation of Orange G using a Sonophotocatalytic reactor, Journal paper, 2004. ( under preparation )
- Hu Hongqiang, Arun S. Mujumdar and Madhumita Bhowmick Ray, Effect of Additional Oxidants on Sonochemical Degradation of Organics, Journal paper , 2004. (In press )
- Z.Q. Lou, A.S. Mujumdar and C. Yap, Effects of geometric parameters on conjugate heat transfer of confined impinging jet, Journal of applied thermal engineering, 2004. (submitted)
- Hee Joo Poh, Kurichi Kumar, Siti Fatimah and Arun S. Mujumdar, Heat Transfer from a Pulsed Laminar Impinging Jet, International Communication of Heat & Mass Transfer, 2004. (submitted)
- S. J. Wang and A. S. Mujumdar, A Comparative Study of Five Low Reynolds Number  $k-\epsilon$  Models for Confined Impinging Jet Streams, Applied Thermal Engineering, 2004. (accepted).
- Shi, YL., A.S. Mujumdar and M.B. Ray. Heat transfer under two dimensional multiple turbulent slot impinging jets of gas-particle suspensions, Numerical Heat Transfer, Part A, February, 2004. (accepted)

## 2003

- Shi Yuling, Ray, M.B. and Mujumdar, A.S., A parametric study of heat transfer in turbulent gas-solid flow in multiple impinging jets, accepted for publication in Industrial & Engineering Chemistry Research.
- Shi Yuling, Ray, M.B. and Mujumdar, A.S., Effects of Prandtl number on impinging jet heat transfer under a semi-confined laminar slot jet, International Communications in Heat and Mass Transfer, Vol.30, No.4, 455-464, 2003.
- Chua, K.J., Mujumdar, A.S. and Chou, S.K., Intermittent drying of bio-products – An overview, Bioresource Technology, Vol. 90, NO. 3, pp. 285-295, 2003
- Li., Jingtang, Mason, D. J. and Mujumdar, A.S., A numerical study of the heat transfer mechanisms in gas-solids flows in pipes using a coupled CFD and DEM model, Drying Technology, Vol. 21, No. 9, pp. 1839-1867, 2003.
- Li, J., Campbell, G.M., and Mujumdar, A.S., Discrete modeling and suggested

- measurement of heat transfer in gas-solids flows, *Drying Technology – An International Journal*, Vol. 21, No. 6, pp. 979-994, 2003.
- Islam, M.R., Ho, J.C., Mujumdar, A.S., Convective drying with time-varying heat input: Simulation results, *Drying Technology – An International Journal*, Vol. 21, No. 7, pp. 1359-1382, 2003.
  - Jia, L.W., Islam, M.R., Mujumdar, A.S., A simulation study on convection and microwave drying of different food products, *Drying Technology-An International Journal*, Vol. 21, No 8, pp. 1551-1576, 2003.
  - Huang, Lixin, Kumar, K. and Mujumdar, A.S., Use of Computational fluid dynamics to evaluate alternative spray chamber configurations, *Drying Technology-An International Journal*, Vol. 21, No 3, pp.385-412, 2003.
  - Shi Yuling, Mujumdar, A.S. and Ray, M.B., Numerical study on the effect of cross-flow on turbulent flow and heat transfer characteristics under normal and oblique semi-confined impinging slot jets, *Drying Technology*, Vol. 21, No 10, pp. 1909-1923, 2003.
  - Huang, Lixin, Kumar, K. and Mujumdar, A.S., Numerical simulation of spray evaporation of organic liquids, to be published in *Drying Technology – An International Journal*, Vol. 21, No. 8, 2003.
  - Islam, Raisul Md., Ho, J.C. and Mujumdar, A.S., Simulation of liquid diffusion-controlled drying of shrinking thin slabs subjected to multiple heat sources, *Drying Technology-An International Journal*, vol. 21, No 3., pp. 413-438, 2003.
  - Islam, Raisul Md. and Mujumdar, A.S., Role of product shrinkage in drying rate predictions using a liquid diffusion model, *International Communications in Heat and Mass transfer*, vol. 30, no. 3, pp. 391-400, 2003.
  - Dedic, A.D., Mujumdar, A.S. and Voronjec, D.K., A three dimensional model for heat and mass transfer in convective wood drying, *Drying Technology – an International Journal*, Vol. 21, No. 1, pp. 1-16, 2003.
  - Ogura, H., Ishida, H., Kage, H. and Mujumdar, A.S., Enhancement of energy efficiency of a chemical heat pump-assisted convective dryer, *Drying Technology*, Vol. 21, No. 2, pp. 279-292, 2003.
  - Islam, M.R., Sablani, S.S. and Mujumdar, A.S., An artificial neural network model for prediction of drying rates, *Drying Technology*, Vol. 21, No. 9, pp. 1867-1885, 2003.
  - Perera, C.O., Jasinghe, V.J., Ng, F.L. and Mujumdar, A.S., The effect of moisture content on the conversion of ergosterol to vitamin D in shitake mushrooms, *Drying Technology*, Vol. 21, No. 6, 1091-1099, 2003.

- Markowski, A., and Mujumdar, A.S., Drying risk assessment strategies, *Drying Technology*, Vol. 21, No., 7-8, 2003.
- Shi Yuling, A.S. Mujumdar and Ray, M. B., Heat transfer under two dimensional multiple turbulent slot impinging jets of gas-particle suspensions, submitted to *Journal of Multi-phase Flow*, April 2003.
- Chua, K.J., Chou, S.K., Mujumdar, A.S., Ho, J.C. and Hon, C. K., Radiant-Convective drying of osmotically treated agro-products: effect on drying kinetics and product quality, *Food Control*, 2003 (In press).
- Huang, Lixin, Kumar, K. and Mujumdar, A.S., A parametric study of the gas flow patterns and drying performance of co-current spray dryer: Results of a computational fluid dynamic study, *Drying Technology*, Vol. 21, No 6, 2003, pp. 957-978.
- Huang, Lixin and Mujumdar, A.S., Classification & Selection of Spray Dryers, *Chemical Industry Digest (India)*, 7-8, p75-84, 2003.
- Huang, Lixin and Mujumdar, A.S., Design of Spray Dryers, *Chemical Industry Digest (India)*, 11-12, p95-102, 2003.
- Pan, Y.K., Zhao, L.J., Zhang, Y., Chen, G. and Mujumdar, A.S., Osmotic Dehydration Pretreatment in Drying of Fruits and Vegetables, *Drying Technology – An International Journal*, 21 (6), 1103-1116, 2003.

## **2. Conference publications (partial list 2003-2004) August 4, 2004**

### **2004**

- Suvarnakuta, P., Devahastin, S., Soponronnarit, S. and Mujumdar, A.S., Drying kinetics and heat transfer of porous particles undergoing low-pressure superheated steam drying, 15<sup>th</sup> International Symposium on Transport Phenomena (ISTP15), Bangkok, Thailand, May 9-12, 2004.
- Mujumdar, A.S., Heat transfer under impinging jets, Keynote Lecture, 15<sup>th</sup> International Symposium on Transport Phenomena (ISTP15), Bangkok, Thailand, May 9-12, 2004.
- Wang, Shijun, Devahastin, S., and Mujumdar, A.S., A computational study of various approaches to improve mixing in confined opposing streams, 15<sup>th</sup> International Symposium on Transport Phenomena (ISTP15), Bangkok, Thailand, May 9-12, 2004.

- Birchal, V.S., Passos, M.L., Wildhagen, G.R.S. and Mujumdar, A.S., The influence of spray dryer operational variables on milk powder quality, 14<sup>th</sup> International Drying Symposium, (IDS 2004), Sao Paulo, Brazil, August 22-25, 2004.
- Ogura, H., Yamamoto, T., Otsubo, Y., Ishida, H., Kage, H. and Mujumdar, A.S., Controllability of a chemical heat pump dryer, 14<sup>th</sup> International Drying Symposium, (IDS 2004), Sao Paulo, Brazil, August 22-25, 2004.
- Trindade, A.L.G., Costa Jr., E.F., Passos, M.L., and Mujumdar, A.S., Drying of non-Newtonian suspensions in conical spouted beds of inert particles: Model and simulation, 14<sup>th</sup> International Drying Symposium, (IDS 2004), Sao Paulo, Brazil, August 22-25, 2004.
- Huang, Lixin, Kumar, Kuruchi, and Mujumdar Arun S., Computational fluid dynamics simulation of spray drying using different models for the falling rate period, 14<sup>th</sup> International Drying Symposium, (IDS 2004), Sao Paulo, Brazil, August 22-25, 2004.
- Huang, Lixin, de A. Passos, M.L., Kumar, Kuruchi, and Mujumdar, Arun S., A three-dimensional simulation of a spray dryer with a rotary atomizer, 14<sup>th</sup> International Drying Symposium, (IDS 2004), Sao Paulo, Brazil, August 22-25, 2004.
- Markowski, Adam S., and Mujumdar Arun S., Layer-of-protection analysis (LOPA) for industrial drying risk assessment, 14<sup>th</sup> International Drying Symposium, (IDS 2004), Sao Paulo, Brazil, August 22-25, 2004.
- Mujumdar, Arun S., Innovation and role of IDS in promoting global R&D effort in drying: A personal perspective, Plenary Lecture, 14<sup>th</sup> International Drying Symposium, (IDS 2004), Sao Paulo, Brazil, August 22-25, 2004.
- Mujumdar, Arun S., Emerging dehydration technologies for preservation of agro-products, Keynote lecture, International Conference on Emerging Technologies in Agricultural and Food Engineering, IIT Kharagpur, Dec. 14-17, 2004.
- Huang, Lixin, Passos, M.L., and Mujumdar, A.S., Comparison of CFD model with experimental results for a spray dryer fitted with a rotating wheel atomizer, International Workshop and Symposium on Industrial Drying, (ISWID2004) Mumbai, India, December, 20-23, 2004.
- Sun, Lan, Islam, Md. Raisul, Ho, J.C. and Mujumdar, A.S., Convective drying of a heat sensitive solid: comparison of experiments with a diffusion model, IWSID2004, Mumbai December 2004.
- Poh, Hee Joo, Kumar, Kuruchi, Mujumdar Arun S., Impingement heat transfer under pulsed single and multiple turbulent air jets, International Workshop and Symposium on Industrial Drying, IWSID 2004, Mumbai, India, December 21-23,

2004.

- Shi, Yu Ling, Mujumdar, A.S. and Ray, M.B., Effect of large temperature differences on local Nusselt number for turbulent slot impinging jet, International Workshop and Symposium on Industrial Drying, (ISWID2004) Mumbai, India, December, 20-23, 2004.
- Wu, Zhonghua and Mujumdar A.S., Pulse combustion spray drying, International Workshop and Symposium on Industrial Drying, (ISWID2004) Mumbai, India, December, 20-23, 2004.
- Mujumdar, Arun S., Global Perspectives on Drying R&D: Needs and Emerging Trends, Plenary lecture, International Workshop and Symposium on Industrial Drying, (ISWID2004) Mumbai, India, December, 20-23, 2004.
- Wu Zhonghua, Mujumdar A.S. and Liu Xiangdong, Numerical Investigation of a pulse combustion spray drying process, 2004 CIGR international conference, Beijing, P.R.China, Oct. 11-14, 2004 (submitted).
- Chan, S. and Huang, L., A parametric study of a novel two-stage horizontal spray dryer, IWSID2004, India, 2004. (submitted)
- Huang, W. and Huang, L., Computational fluid dynamic simulation of an industrial spray dryer for coffee, IWSID2004, India, 2004. (submitted)
- S. J. Wang and A. S. Mujumdar, Mixing characteristics of 3D confined turbulent opposing jets, Mini-Symposium in Honour of Professor Arun S. Mujumdar at IWSID2004, Mumbai, December, 20-23, 2004, (accepted)

## **2003**

- Mujumdar, A.S., 2003, Innovation in thermal drying technologies and future R&D needs, Keynote lecture, Proceedings of 14<sup>th</sup> International Symp. on Transport Phenomena, Bali, July 7-9, 2003.
- Mujumdar, A.S. and Alves-Filho, O., Emerging Drying Technologies: Future Trends and R&D Needs, Keynote Lecture, 2<sup>nd</sup> Nordic Drying Conference, Copenhagen, Denmark, June 25-27, 2003 (CD Proceedings).
- Alves-Filho, O. and Mujumdar, A.S., International Drying R&D, Invited lecture, EUDrying 03, Crete, Greece, September 4-5, 2003.
- Mujumdar, A.S. Invited Lecture on Developments in Drying of Grains and Cereals, Regional Seminar on Grain Drying in South Asia, December 1-2, 2003,

Durgapur, India ( Australian Project) Also, Chief Guest and Inaugural Address

- Mujumdar, A.S. Recent Advances in Food Dehydration, Keynote Lecture, CoFE, AIChE Conference, San Francisco, USA, November 18-20, 2003.
- Gaikwad, S.B., Wang, W., Chen, G., Thorat, B. and Mujumdar A.S., Fluidized bed drying with microwave heating: Effect of loss factor, NDC'03, 2<sup>nd</sup> Nordic Drying Conference, Copenhagen, Denmark. June 27-27,2003
- Ogura, H. and Mujumdar, A.S., Chemical heat pump drying in the heat storing step, ADC'03, 3<sup>rd</sup> Asia-Pacific Drying Conference, September 1-3, 2003, Bangkok, Thailand.
- Huang, L., Kumar, K. and Mujumdar, A.S., Numerical Experiments with evaporation of water droplets in a Mixed Flow Spray chamber, NDC'03, 2<sup>nd</sup> Nordic Drying Conference, Copenhagen, Denmark, June 25-27, 2003.
- Huang, L., Kumar, K. and Mujumdar, A.S., Some CFD simulations of spray drying chambers – Effects of operating conditions, ADC'03, 3<sup>rd</sup> Asia-Pacific Drying Conference, September 1-3, 2003, Bangkok, Thailand.
- Islam, M.R., Sablani, S.S., Mujumdar, A.S., Prediction of drying rates using artificial networks, 3<sup>rd</sup> Asia-Pacific Drying Conference, Asian Institute of Technology, Proceedings, pp. 447-455, Sept. 1-3, 2003, Bangkok, Thailand
- Islam, M.R., Ho, J.C., and Mujumdar, A.S., Some numerical simulations with liquid diffusion model and their practical significance, ADC'03, 3<sup>rd</sup> Asia-Pacific Drying Conference, Proceedings, pp. 645-656, September 1-3, 2003, Bangkok, Thailand.
- Islam, M.R., Khoo, B.K.S., Mujumdar, A.S., Drying of heat-sensitive materials with continuous and intermittent application of heat pump and radiant heating, 5<sup>th</sup> International Conference on Mechanical Engineering (ICME), Dhaka, Bangladesh, December, 2003, Submitted.
- Huang, L, Kumar, K and Mujumdar, A.S., 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, 1-3/Sept./2003, pp97-112, 2003.

### **3. Book articles/chapters (2003-2004)**

- Wu Zhonghua and Mujumdar, A.S., Is Bombardier Beetle design suited for a

- Pulse Combustor, Topics Heat and Mass Transfer, Ed. B N Thorat, S.Devahastin and G. Chen International Workshop and Symposium on Industrial Drying Conference, Accepted for publication, University of Mumbai Press, Mumbai, India, December 2004.
- Ravi Kandasamy, Zhao Ki and Toh Keng Wi, Feasibility Study for the Application of Phase Change Material (PCM) in Thermal Management of Portable Electronic Devices, Topics Heat and Mass Transfer, Ed. B N Thorat, S.Devahastin and G. Chen International Workshop and Symposium on Industrial Drying Conference, Accepted for publication, University of Mumbai Press, Mumbai, India, December 2004.
  - Wang, X.Q., Yap, C. and Mujumdar, A.S., Heat Transfer and Fluid Flow Through Fractal-Like Microchannels, Topics Heat and Mass Transfer, Ed. B N Thorat, S.Devahastin and G. Chen International Workshop and Symposium on Industrial Drying Conference, Accepted for publication, University of Mumbai Press, Mumbai, India, December 2004.
  - Arun.S.Mujumdar, Wu zhonghua, Pulse Combustion drying-Technology of the Future, Chapter 11 ( Guide book).
  - Chen, G., Yue, P. L. and Mujumdar, A.S., Dewatering and Drying of Wastewater Treatment Sludge, in Handbook of Industrial Drying, Ed. A.S. Mujumdar, Dekker, 3<sup>rd</sup> edition, to be released in 2004.
  - Chen, G. and Mujumdar, A.S., Drying of Herbal Medicines and Tea, in Handbook of Industrial Drying, Ed. A.S. Mujumdar, Marcel Dekker, 3<sup>rd</sup> edition, to be released in 2006.

Compiled by X-Q. Wang, NUS, ME Department, August 4, 2004

This is not a complete list.