

# Jinhong Zhang

Department of Mining and Geological Engineering  
The University of Arizona  
Mines Bldg., Room 243  
1235 E. James E. Rogers Way  
P.O. Box 210012  
Tucson, AZ 85721-0012

Tel: (520) 626-9656  
Fax: (520) 621-8330  
E-mail: [jhzhang@email.arizona.edu](mailto:jhzhang@email.arizona.edu)

## EDUCATION

Ph.D. in Mining and Minerals Engineering, Virginia Tech, 2006

## RESEARCH EXPERIENCE

### **2007-present** *Assistant Professor, Mining and Geological Engineering, University of Arizona*

- Set up a surface chemistry lab specifically for the fundamental research of mineral processing. The research involves the surface force measurement, modification of surface hydrophobicity and surface free energy; the adsorption of collectors on mineral surface and its effects on grinding and flotation;
- Collaborated and gave lectures in the course of MN\_E200 in 2007 fall semester;
- Gave lectures of MN\_E411/511 'Mineral Processing' in 2007 fall semester;
- Gave lectures of MN\_E439/539 'Surface Chemistry of Flotation' in 2008 spring semester;
- To gave lectures of MN\_E513 'Surface Characterization Techniques' in 2008 fall semester;
- Setting up a mineral processing lab;

### **2001-2006** *Research/Teaching Assistant, Mining and Minerals Engineering, Virginia Tech*

- Established the relationship between surface force, surface hydrophobicity and surface free energy and its utilization in the industry practices of surface coating, dispersion, coagulation, flocculation and flotation;
- Built up the wetting film apparatus to measure the thickness of wetting films on solid surfaces and the kinetics of film thinning on hydrophilic surfaces;
- Investigated the surfactant adsorption on silica surfaces using an Atomic Force Microscope (AFM) imaging technique;
- Investigated the surface force between mineral surfaces (Silica, Rutile) in surfactant solutions using an Atomic Force Microscope (AFM); proposed the degassing effect, salt effect and surfactant chain length effect on the non-DLVO long range attraction, which is vital in the dispersion, coagulation and flotation of minerals in solution;
- Primary researcher and co-author of the report "Surface Characterization of Talc-Applications to Practice" for a talc company. The work involves characterization of particle size and solid surface wettability, Zeta potential measurement and surface free energies of Talc powders w/o chemicals

(polymer and surfactant)coating; investigated the effects of chemicals addition on the wettibility and surface free energies of talc powders;

- Utilized contact angle measurement and Thin-layer wicking technique to study the solid surface free energy of powders;

## RESEARCH ACTIVITIES

### Journal Papers

Jinhong Zhang, Roe-Hoan Yoon and Jan Christer Eriksson, “*AFM Surface Force Measurements Conducted with Silica in  $C_n$ TACL Solutions: Effect of Chain Length on Hydrophobic Force*”, *Colloids and Surfaces A: Physicochemical and Engineering Aspects*, Vol. 300, 3, 2007, P 335-345

Jinhong Zhang, Roe-Hoan Yoon, Min Mao and William A. Ducker, “*Effects of Degassing and Ionic Strength on AFM Force Measurements in Octadecyltrimethylammonium Chloride Solutions*”, 2005, *Langmuir* 21, 5831-5841.

Min Mao, Jinhong Zhang, Roe-Hoan Yoon, and William A. Ducker; “*Is There a Thin Film of Air at the Interface between Water and Smooth Hydrophobic Solids?*”, *Langmuir* 2004, 20, 1843-1849.

Min Zeng and Jinhong Zhang, “*Study of the removal of Ti and Fe from the coal measure kaolin by roasting*”, *China Mining*, 1998, vol. 7, 3, 48-50.

Min Zeng and Jinhong Zhang, “*Chlorination and roasting of the coal measure kaolin*”, *Coal Processing and Comprehensive Utilization*, 1997, 2, 20-22.

Xuxin Shao, Zexue Du, Zhendong Liu and Jinhong Zhang, “*Study of desulfuration of fine coal using flotation*”, *Coal Transaction*, 1996, 2.

Jinhong Zhang and Xuxin Shao, “*Resource and utilization of coal-measure kaolin in China*”, *Chemical Engineering and Technology in Mine*, 1995, 12.

### Conference Proceedings and Papers

Jinhong Zhang, Sugiharto Wiyono, Paul lee, William Xiao, “*Contact Angle and Surface Analysis Studies of Molybdenite*”, *SME Annual Meeting*, 2009 (Submitted)

Jinhong Zhang and Roe-Hoan Yoon, “*Surface Force Measurement between Oxide Surfaces in  $C_n$ TACL Solutions Studied by an AFM*”, *XXIV IMPC*, August, 2008 (Accepted)

Jinhong Zhang and Roe-Hoan Yoon, “*An AFM Study of the Surface Force between Oxide Surfaces in Aqueous Solutions*”, 2008 Robert S. Shoemaker International Symposium on Hydrometallurgy, August, 17-20, 2008, Phoenix, AZ (Accepted)

Jinhong Zhang and Roe-Hoan Yoon, “*Determination of the basal and edge surface free energies of talc using the acid-base theory*”, *The 81st ACS Colloid & Surface Science Symposium*, June 24-27, 2007, Newark, DL

Jinhong Zhang, Roe-Hoan Yoon and Jan Christer Eriksson, “*Adsorption of Cationic Surfactants on Silica Studied by AFM: Surface Forces and Images*”, *45th Conference of Metallurgists*, October 1-4, 2006, Montréal, Québec, Canada

Jinhong Zhang and Roe-Hoan Yoon, “*Direct Force Measurement in Flotation*”, July 25, 2006, *National Energy Technology Laboratory (NETL)*, Morgantown

Jinhong Zhang, Roe-Hoan Yoon and Jan Christer Eriksson, "*Effect of Surfactant Chain Length on the Long-Range Attractive Force*", XIIIth International Conference on Surface Forces, June 28 - July 4, 2006 Moscow, Russia

Emilio Lobato, Jinhong Zhang, Ismail Yildirim, Roe-Hoan Yoon and Jorge Yordan, "*Characterization of Surface Free Energies of Talc Powders using Thin-Layer Wicking Technique*", SME Annual Meeting, March, 2006

Jinhong Zhang, Roe-Hoan Yoon, Min Mao and William A. Ducker, "*Effect of Dissolved Gas on the Force between Silica and Glass in Aqueous Octadecyltrimethylammonium Chloride Solutions*", Centenary of Flotation, Brisbane Australia, June 5-9 2005

Ismail Yildirim, Jinhong Zhang, and Roe-Hoan Yoon, "*Effect of Surface Treatment on the Acid-base Properties of Fillers and Pigments*", SME Annual Meeting, 2003

### **SELECTED HONORS**

Excellent Graduate, 2006, Mining and Minerals Engineering, Virginia Tech, USA.

Pratt Graduate Fellowship, 2005, Mining and Minerals Engineering, Virginia Tech, USA.

### **RESEARCH SKILLS**

- Surface force measurement using an Atomic Force Microscope (AFM);
- Surface imaging technique using an Atomic Force Microscope (AFM);
- Zeta potential measurement;
- Laboratory flotation test;
- Surface/interfacial tension & solid surface free energy measurement;
- Contact angle measurement;
- Wetting film technique for film thickness measurement;
- Thin-layer wicking technique for the contact angle and surface free energy measurements of powders.