

Shangzhao Shi

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EDUCATION

Master, Materials Science and Engineering

November 1985

Luoyang Institute of Refractories Research,
Luoyang, Henan, P.R. China
Thesis: Effect of heating rate on sintering of oxides

Bachelor of Science, Chemistry

July 1982

Zhengzhou University, Zhengzhou, Henan, P.R. China
Thesis: The catalytic activity of iron oxide catalyst on synthesis of ammonia

PROFESSIONAL EXPERINECE

**Visiting Research Scholar, Assistant Research Engineer
Research Scientist/Engineer I**

03/2000-present

Institute of Materials Processing
Department of Materials Science & Engineering
Michigan Technological University
Houghton, Michigan

Visiting Research Scholar 04/1999-02/2000
Center for Advanced Materials Processing
Clarkson University
Potsdam, New York

Lecturer, Associate Professor 10/1990-03/1999
Materials Engineering Department
Luoyang Technology college
Luoyang, Henan, P.R. China

Assistant Engineer, Engineer 11/1985-09/1990
Special Refractories Department
Luoyang Institute of Refractories Research
Luoyang, Henan, P.R.China

PROFESSIONAL ORGANIZATIONS

Member, The International Microwave Power Institute (USA)
Member, Sigma Xi Society

PUBLIC SERVICES

Member, The Henan Provincial Committee for Evaluation of Senior Professional
& Technical Qualifications at High Education Institutions
Chemistry & Chemical Engineering Panel

Referee, *China's Refractories*
Referee, *Journal of Materials Processing Technology*
Referee, *Acta Materialia*
Referee, *ICA-CIMAT Research pre- and full- Proposal*

Current Research interests and projects

New concepts and materials for hydrogen storage	co-PI	US Department of Energy
Microwave assisted steelmaking	co-PI	US Department of Energy Michigan State Government

Electrical field manipulated surface chemistry

PUBLICATIONS & PRESENTATIONS

(Published in English if not indicated)

1. Jiann-Yang Hwang, Shangzhao Shi; “Novel Perhydrides for Hydrogen Storage”; Accepted by the 2005 TMS Annual Meeting, September 25-28, 2005: Pittsburgh, PA, and to be published in the Proceedings of Materials for the Hydrogen Economy
2. Jiann-Yang Hwang, Shangzhao Shi, Bowen Li, Xiang Sun; “Storing Hydrogen with Metal Perhydrides ”; Invited presentation for a special TMS symposium, "Advanced Materials For Energy Conversion III", 2006 TMS Annual Meeting, 03/12/2006 - 03/16/2006, San Antonio, TX, USA
3. Jiann-Yang Hwang, Shangzhao Shi, Zhiyong Xu and Karl W. Peterson; “Synthesis of monodispersed iron oxide particles in a large-scale microwave reactor”; *Presented at the 4th World Congress on Microwave & RF Applications*; Austin, Texas; Nov. 7-12, 2004.
4. Shangzhao Shi, Jiann-Yang Hwang, Bowen Li and Xiaodi Huang; “Microwave sintering of magnesium fluoride”; *Presented at the 4th World Congress on Microwave & RF Applications*; Austin, Texas; Nov. 7-12, 2004.
- 3 Bowen Li, Xiaodi Huang, Jim Y. Hwang, Shaolong Qu, Shangzhao Shi and Zhiyong Xu; “Acceleration of Microwave Irradiation on the Melting of Fluoride”; Presented at *the 4th World Congress on Microwave & RF Applications*; Austin, Texas; Nov. 7-12, 2004.
5. Shangzhao Shi and Jiann-Yang Hwang; “Plasma spray fabrication of near-net-shape ceramic objects”; *Journal of Minerals & Materials Characterization & Engineering*, 2 [2] 145-150 (2003).
6. Shangzhao Shi and Jiann-Yang Hwang; “Microwave-assisted wet chemical synthesis: advantages, significance, and steps to industrialization”; *Journal of Minerals & Materials Characterization & Engineering*, 2 [2]101-110 (2003).
7. Jiann-Yang Hwang, Shangzhao Shi, Zhiyong Xu and Xiaodi Huang; “Microwave-assisted chalcocite leaching in CuCl₂-NaCl media under oxygen pressure”, Presented at the TMS’ 132nd Annual Meeting, San Diego, California. EPD Congress 2003 Edited by M.E. Schlesinger, TMS 2003, pp 11-16.
8. X. Huang, J.Y. Hwang, S. Shi, R.C. Greenlund, Z. Xu, A.M. Hein, “Potential Application of Microwaves in Steelmaking,” Presented at the 3rd World Congress on Microwave and Radio Frequency Applications, Sydney, Australia, September 2002
9. J.Y. Hwang, S. Shi, Z. Xu, and X. Huang, “Oxygenated Leaching of Copper Sulfide Mineral Under Microwave Hydrothermal Conditions,” *Journal of Minerals and Materials Characterization and Engineering*, V.1, No. 2, pp. 111-119.
10. I. Sondi, S. Shi, E.Matijevic; “Preparation of monodispersed basic iron (III) sulfate (sodium jarosite) particles”; *Colloid Polym Sci*, 279161-165, 2001;

11. Shangzho Shi, Fuqiu Xu, Shixi Zhao, Zhiyuan Hu and Quanlin Dong; "Microwave calcination of niobium pentahydroxide"; *Proceedings of 33rd microwave power symposium*, pp35-38, July 12-15, 1998; Chicago, Illinois, USA ;
12. Shangzhao Shi, Fanping Meng; "Acceleration effect of microwaves on the PN-junction development in n-type silicon semiconductor chips", *Journal of Luoyang Technology College*, 7 (3) 20-22, 1997 (in Chinese);
13. Fuqiu Xu, Shixi Zhao and Shangzhao Shi; "Determination of ignition loss of non-ferrous ores by microwave heating"; *Lihua Janyan, Huaxue Fenxi*, May 1997, 33(5), 214-215 (in Chinese) (included in Chemical Abstracts, 128: 29742r);
14. Shangzhao Shi, Shuchun Men; "Disposal of industrial waste using microwave processing technology"; *Guowai Huanjing Kexue*, 88 (3), 39-41, 1997 (in Chinese);
15. Shangzhao Shi, Fuqiu Xu, Shixi Zhao and Xinglong Li; "Direct Temperature Measurement in Microwave Ovens for Processing of Refractories";, *Proceedings of the international symposium on refractories*, November 12-15, 1996, Haikou, China, pp. 669-675.
16. Shangzhao Shi, Fuqiu Xu and Shixi Zhao; "Thermal impedance of rectangular microwave oven linings"; *China's Refract.*, 5[3] 31-33, 1996 (included in Chemical Abstracts:125: 307098b);
17. Shangzhao Shi, Shuchun Men, Guangwei Li, Baoliang Wang and Longxing Li, "High temperature microwave ovens for refractory laboratories"; *India Int. Refract. Congr.* '96, 1996,1 pp.256-60 (included in Ceramic Abstracts, 75-07566A)
18. Shixi Zhao, Fuqiu Xu and Shangzhao Shi; "Microwave heating of silicon carbide"; *China Ceramics*, 32[1], 25-27, 1996 (in Chinese);
19. Shangzhao Shi, Wansheng Liu and Shixi Zhao; "Application and prospect of microwave heating technology in materials engineering"; *Naihuo Cailiao/Refractories*, 29[4] 231-233, 1994 (in Chinese);
20. Shangzhao Shi; "Sintering of ceramic in non-uniform electric field", *Proceedings of the sixth international symposium on science and technology of sintering*, Oct. 23-25, 1995, Haikou, China. pp 40-45 (included in Chemical Abstracts, 126:202733x);
21. Shangzhao Shi; "Contribution of electric force to sintering: III, abnormal sintering mechanisms due to electric-force-driven ionic diffusion", *China's Refract.*,3[3] 31-37, 1994 (included in Chemical Abstracts, 122:15274d);

22. Shangzhao Shi; "Contribution of electric force to sintering: II, nature of the applied electric field for driving ionic diffusion", *China's Refract.*,3[1] 27-32, 1994 (included in Chemical Abstracts, 124:13632m);
23. Shangzhao Shi; "Contribution of electric force to sintering: I, The inner electric field induced by cation-anion separation in ionic crystals", *China's Refract.*, 2[1] 24-30, 1993 (included in Chemical Abstracts, 121:89711v);
24. Shangzhao Shi; "Relationships between toughening mechanisms of ceramics", *China's Refract.*, 1[1] 18-22, 1992 (included in Ceramic Abstracts, 73-17420A);
25. Shangzhao Shi; "Contribution of phase stress to sintering"; *LIRR's Selected Papers on Refractories*, 1990, 2, pp49-54 (included in Ceramic Abstract, 72-02549A)