



Department: School of Resources and Environmental Engineering  
Professional field: Environmental Science and Engineering,  
Chemical engineering and technology  
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## Profile

2012.09-today: Associate professor, school of resources and environmental engineering, supervisor for Ph.D. and Master.

2018.08-today: School of resources and environmental engineering, Head of Resource Engineering Department

2009.06-2012.8: Lecture, school of resources and environmental engineering,

2016.12-2017.12: QingHai Salt Lake Industry Co.,Ltd., Deputy director of R & D Center

2016.02-2016.03: International cooperation and exchange, University of Birmingham, University of Nottingham

2012.11-2013.11: Visiting scholar, University of Leeds, UK

Courses:

Undergraduate Course: Engineering Fluid Mechanics (Shanghai Key Course)

Committee and Broad Memberships:

Molten salt energy storage Committee of China Association of inorganic salts Deputy Secretary General

Molten salt chemistry and Technology Committee of China Nonferrous Metals Society Committee member

Institute of Haixi Environmental Science Visiting professor

## Research Field

1. Utilization of solar energy, and molten salt for energy and heat storage
2. Numerical simulation of chemical process, and numerical analysis of multi physical fields.

## Research results and selected published papers

Awards:

2019, First prize of science and technology progress of China Nonferrous Metals Industry

2011, Second prize of national science and Technology Progress Award

2010, First prize of Shanghai Science and Technology Progress Award

2013, Third prize of Shanghai Technology Invention Award

Projects:

- (1) National Key R&D Program of China, 3600 k, in charge,
- (2) National Natural Science Foundation of China (NSFC), 600 k, in charge,
- (3) National Natural Science Foundation of China (NSFC), 600 k, in charge, complete
- (4) National Natural Science Foundation of China (NSFC), 250 k, in charge, complete

Journal Papers:

1. Haiou Ni, Jie Wu, Ze Sun\*, Guimin Lu\*, Jianguo Yu. Insight into the viscosity enhancement ability of  $\text{Ca}(\text{NO}_3)_2$  on the binary molten nitrate salt: A molecular dynamics simulation study. Chemical Engineering Journal. Just accepted. doi.org/10.1016/j.cej.2018.09.190
2. Haiou Ni, Jie Wu, Ze Sun\*, Guimin Lu\*, Jianguo Yu. Molecular simulation of the structure and physical properties of alkali nitrate salts for thermal energy storage. Renewable Energy 2019, 136: 955-967
3. Hang Chen, Ze Sun\*, Xingfu Song, and Jianguo Yu\*. Equilibrium Characteristics of  $\text{KH}_2\text{PO}_4$  Production by Liquid, Liquid Extraction with a Trialkyl Amine-Based Solvent Mixture: A Case Study. Journal of Chemical & Engineering Data. 2018, 63: 4024-4031
4. Ze Sun\*, Chongjing Hu, Haiou Ni, Guimin Lu, Xingfu Song, Jianguo Yu\*. Influence of Impurity  $\text{SO}_4^{2-}$  on the Thermal Performance of Molten Nitrates used for Thermal Energy Storage. Energy Technology. 2018, 6(10): 2065-2073
5. Ze Sun\*, Liwei Cai, Haiou Ni, Guimin Lu, Xingfu Song, Jianguo Yu\*. Investigation of the local structures and transport properties of quaternary molten alkali chloride systems by MD simulations for liquid metal batteries. Journal of Applied Electrochemistry. 2018, 48:1175-1187
6. Ze Sun\*, Liwei Cai, Haiou Ni, Gui-Min Lu and Jian-Guo Yu. Coupled electro-thermal field in a high current electrolysis cell or liquid metal batteries. Royal Society Open Science.2018, 5: 171309
7. Ze Sun\*, Liwei Cai, Chenglin Liu, Guimin Lu and Jianguo Yu\*. Analysis for Effects of Electrolyte Level on Energy Consumption in Magnesium Electrolysis by Finite Element Method. The Canadian Journal of Chemical Engineering. 2017,95(4): 648-655
8. Ze Sun\*, Chongjing Hu, Chenglin Liu, Guimin Lu and Jianguo Yu\*. Optimization of Mixing Parameters for a Cold Model System by CFD for Aluminum Matrix Composites Synthesis process. The Canadian Journal of Chemical Engineering. 2017, 95(3):467-474
9. Hang Chen, Ze Sun\*, Xingfu Song and Jianguo Yu\*. Operating Regimes and Hydrodynamics of a Rotating-Disc Contactor. Chemical Engineering & Technology. 2017, 40(3): 498-505
10. Ze Sun\*, Jia Wang, Wei Du, Guimin Lu, Ping Li, Xingfu Song and Jianguo Yu. Density functional theory study on the thermodynamics and mechanism of carbon dioxide capture by  $\text{CaO}$  and  $\text{CaO}$  regeneration. RSC Advances. 2016,6: 39460-39468
11. Hang Chen, Ze Sun, Xingfu Song, Jianguo Yu\*. A pseudo-3D model with 3D accuracy and 2D cost for the CFD-PBM simulation of a pilot-scale rotating disc contactor. Chemical Engineering Science. 2016, 139: 27-40
12. Hang Chen, Ze Sun\*, Xingfu Song, and Jianguo Yu\*. Efficient Extraction of Phosphoric Acid with a Trialkyl Amine-Based Solvent Mixture. Journal of Chemical & Engineering Data. 2016, 61 (1): 438-443
13. Ze Sun\*, Chenglin Liu, Guimin Lu, Xingfu Song, Jianguo Yu. Effects of operational and structural parameters on cell voltage of industrial magnesium electrolysis cells. Frontiers of Chemical Science and Engineering. 2015, 9(4): 522-531
14. Ze Sun\*, Haiou Ni, Hang Chen, Suzhen Li, Guimin Lu and Jianguo Yu. Designing and optimizing a stirring system for a cold model of lithium electrolysis cell based on CFD simulations and optical experiments. RSC Advances, 2015, 5, 84503 - 84516
15. Jia Wang, Jie Wu, Ze Sun\*, Guimin Lu\*, Jianguo Yu. Molecular dynamics study of the transport properties and local structures of molten binary systems ( $\text{Li}$ ,  $\text{Na}$ ) $\text{Cl}$ , ( $\text{Li}$ ,  $\text{K}$ ) $\text{Cl}$  and ( $\text{Na}$ ,  $\text{K}$ ) $\text{Cl}$ . Journal of Molecular Liquids, 2015, 209: 498-507
16. Zhen Liu, Ze Sun\* and Jian-Guo Yu\*. Investigation of dodecylammonium adsorption on mica, albite and quartz surfaces by QM/MM simulation. Molecular Physics. 2015, 113(22): 3423-3430
17. Chenglin Liu, Ze Sun\*, Guimin Lu, Xingfu Song, Jianguo Yu\*. 3D and 2D experimental views on the flow field of gas-evolving electrode cold model for electrolysis magnesium. Flow Measurement and Instrumentation. 2015, 45: 415-420
18. Cheng-Lin Liu, Ze Sun\*, Gui-Min Lu, Xing-Fu Song, and Jian-Guo Yu\*. Experimental and numerical investigation of two-phase flow patterns in magnesium electrolysis cell with non-uniform current density distribution. The Canadian Journal of Chemical Engineering. 2015, 93(3): 565-579
19. Hang Chen, Ze Sun\*, Xingfu Song, and Jianguo Yu\*. Key parameters prediction and validation for a pilot-scale rotating disc contactor by CFD-PBM simulation. Industrial & Engineering Chemistry Research. 2014, 53 (51), pp 20013-20023
20. Jia Wang, Ze Sun\*, Guimin Lu\*, and Jianguo Yu. Molecular Dynamics Simulations of the Local Structures and Transport Coefficients of Molten Alkali Chlorides. Journal of Physical Chemistry B. 2014, 118, 10196-10206
21. Chenglin Liu, Ze Sun\*, Guimin Lu, Xingfu Song, Yulong Ding and Jianguo Yu. Scale-up design of a 300 kA magnesium electrolysis cell based on thermo-electric mathematical models. The Canadian Journal of Chemical Engineering. 2014, 92(7):1197-1206