# **Guanyi Chen,** PhD and professor

**Dean:** School of Environmental Science & Engineering, Tianjin University, China

**Director:** China-Australia Center for Sustainable Urban Development, Center for Bio-Energy System and Environment



Tel: +86-22-87401929 | M: +86 13512208049 | E-mail: chen@tju.edu.cn


## Education

Mar.1995–Aug.1998, Ph.D. Zhejiang University, China
Specializing in Thermal Pyrolysis of Biomass, Department of Energy Engineering
Sept.1992–Mar.1995, MSc. Zhejiang University, China
Specializing in Gasification of Biomass in Fluidised Bed, Department of Energy Engineering
Sept.1988–Jul. 1992, BE Xi'an Jiaotong University, China
Majoring in Thermal Power Engineering, Department of Energy & Power Engineering,

## Work Experience

Oct.2009–present, **Chair Professor** of BioEnergy/Environment and **Dean** of School of Environmental Science and Engineering, Tianjin University, China
Sept.2013–present, **Director** of China-Australian Center for Sustainable Urban Development
Mar.2003–Sept.2009, **Professor** of BioEnergy and Environment, School of Environmental Science and Engineering, Tianjin University, China
Sept. 1999–Mar. 2003, **Senior Research Fellow**, Energy Section, Faculty of Mechanical Engineering, Delft University of Technology, Netherlands
Nov. 1998–Jun.1999, **Research Assistant,** Dept. of Mechanical Engineering, The University of Hong Kong, Hong Kong, China

## Research Interests

1. Biomass/waste to energy (electricity, syngas, hydrogen etc) by pyrolytic-gasification conversion
2. Innovative integration of thermal-chemical-biological conversion of biomass
3. Algae-based energy plant and biomass energy system assessment
4. Waste incineration and gasification: process improvement and pollution control
5. Environmental materials, pollution control, and Marine Mirco-Plastics

## Professional Contributions

Prof. Chen has been responsible for a number of large research and development projects at a local, national and international level in the field of Energy Production from Biomass and Waste, and associated environmental pollution control in last 10 years. Those projects were financially funded by National Science Foundation of China, Ministry of Science and Technology, Ministry of Education, Tianjin Municipality, and European Commission as well as domestic and international industrials. He has participated in a number of professional international/domestic conferences as a joint organizer, oral speaker, plenary speaker, and scientific committee member. And he has made the contribution to more than 250 scientific papers (over 120 SCI-indexed journal papers), 20 patents, and several professional societies including International Scientific Journals and Chinese Scientific Journals. He plays an active role in reviewing different-level R&D projects and papers for scientific journals.

## Publications Selected

1. **Guanyi Chen**, Yunan Sun, Beibei Yan, Ruilei Yang, Bin Liu, Zhanjun Cheng, Wenchao Ma, Distribution of trace elements during coal Gasification : The effect of upgrading method. JOURNAL OF CLEANER PRODUCTION, 190(2018)193-199.

2. **Guanyi Chen**, Ruilei Yang, Zhanjun Cheng, Beibei Yan, Wenchao Ma, Nitric oxide formation during corn straw/sewage sludge co-pyrolysis/gasification. JOURNAL OF CLEANER PRODUCTION, 197(2018)97-105.

3. Weijuan Lan, **Guanyi Chen**, Xinli Zhu, Xuetao Wang, Chunmei Liu, Bin Xu, Biomass gasification-gas turbine combustion for power generation system model based on ASPEN PLUS. Science of The Total Environment, 628-629(2018)1278-1286

4. **Guanyi Chen,** Ruixue Zhang, Wenchao Ma, Bin Liu, Xiangping Li, Beibei Yan, Zhanjun Cheng, Tiejun Wang, Catalytic cracking of model compounds of bio-oil over HZSM-5 and the catalyst deactivation. Science of The Total Environment,

631-632(2018)1611-1622.
5. **Guanyi Chen**, Xiang Guo, Zhanjun Cheng, Beibei Yan, Zeng Dan, Wenchao Ma, Air gasification of biogas-derived digestate in a downdraft fixed bed gasifier. Waste Management, 69(2017)162-169.
6. Yanan Guan, **Guanyi Chen**, Zhanjun Cheng, Beibei Yan, Li'an Hou, Air pollutant emissions from straw open burning: A case study in Tianjin. Atmospheric Environment, 171(2017)155–164.
7. **Guanyi Chen**, Jing Liu, Jingang Yao, Yun Qi, Beibei Yan, Biodiesel production from waste cooking oil in a magnetically fluidized bed reactor using whole-cell biocatalysts. Energy Conversion and Management, 138(2017)556–564.
8. **Guanyi Chen**, Sirong He, Zhanjun Cheng, Yanan Guan, Beibei Yan, Wenchao Ma,Dennis Y.C. Leung, Comparison of kinetic analysis methods in thermal decomposition of cattle manure by themogravimetric analysis. Bioresource Technology, 243(2017)69–77.
9. Xiang Ji, Bin Liu, Wenchao Ma, **Guanyi Chen**, Beibei Yan, Zhanjun Cheng, Effect of MgO promoter on Ni-Mg/ZSM-5 catalysts for catalytic pyrolysis of lipid-extracted residue of Tribonema minus. Journal of Analytical and Applied Pyrolysis, 123(2017)278–283.
10. Xiangping Li, **Guanyi Chen**, Caixia Liu, Wenchao Ma, Beibei Yan, Jianguang Zhang, Hydrodeoxygenation of lignin-derived bio-oil using molecular sieves supported metal catalysts: A critical review. Renewable and Sustainable Energy Reviews, 71(2017) 296–308.
11. Wenchao Ma, Ruixue Zhang, **Guanyi Chen**, and Bin Liu. Hydrodeoxygenation of Vanillin Over Various Metal Loading on ZSM-5/MCM-41 Under Mild Condition. Journal of Biobased Materials and Bioenergy Vol.11, 1–5, 2017.
12. **Guanyi Chen**, Junyu Tao, Caixia Liu, Beibei Yan, Wanqing Li, Xiangping Li, Hydrogen production via acetic acid steam reforming: A critical review on catalysts. Renewable and Sustainable Energy Reviews, 79(2017)1091–1098.
13. **Guanyi Chen**, Jian Li, Cong Liu,Beibei Yan,Zhanjun Cheng, Wenchao Ma, Jingang Yao, Huan Zhang, Low-Temperature Catalytic Cracking of Biomass Gasifcation Tar Over Ni/HZSM-5. Waste Biomass Valorization, 2017(3):1-8.
14. **Guanyi Chen**, Junyu Tao, Caixia Liu, Beibei Yan, Wanqing Li,Xiangping Li, Steam reforming of acetic acid using Ni/Al2O3 catalyst: Influence of crystalline phase of Al2O3 support. International Journal of Hydrogen Energy,42(2017):20729-20738.
15. **Guanyi Chen**, Rui Shan, Beibei Yan, Jiafu Shi, Shangyao,etc. Remarkably enhancing the biodiesel yield from palm oil upon abalone shell-derived CaO catalysts treated by

ethanol. Fuel Processing Technology, 143(2016)110-117.
16. **Guanyi Chen**, Gang Liu, Beibei Yan, Rui Shan, Jianan Wang, Experimental study of co-digestion of food waste and tall fescue for bio-gas production. Renewable Energy, 88(2016)273-279.
17. **Guanyi Chen**, Jing Liu, Yun Qi，Jingang Yao，Beibei Yan, Biodiesel production using magnetic whole-cell biocatalysts by immobilization of Pseudomonas mendocina on Fe3O4-chitosan microspheres. Biochemical Engineering Journal, 113(2016)86-92.
18. **Guanyi Chen**, Jingang Yao，Jing Liu，Beibei Yan，Rui Shan, Biomass to hydrogen-rich syngas via catalytic steam reforming of bio-oil. Renewable energy, 91(2016)315-322.
19. Jingang Yao, Jing Liu, Hermann Hofbauer, **Guanyi Chen**, Beibei Yan, Rui Shan, Wanqing Li, Biomass to hydrogen-rich syngas via steam gasification of bio-oil/biochar slurry over LaCo1−xCuxO3 perovskite-type catalysts. Energy conversion and Management, 117(2016)343-350.
20. Beibei Yan, Ying Zhang, **Guanyi Chen**, Rui Shan, Wenchao Ma, The utilization of hydroxyapatite-supported CaO-CeO2 catalyst for biodiesel production. Energy conversion and Management, 130(2016)156-164.
21. **Guanyi Chen**, Jingang Yao, Jing Liu, Beibei Yan, Rui Shan, Biomass to hydrogen-rich syngas via catalytic steam gasification of bio-oil/biochar slurry. Bioresource Technology, 198(2015)108-114.
22. **Guanyi Chen,** Rui Shan, Shangyao Li, Jiafu Shi, A biomimetic silicification approach to synthesize CaO-$SiO_2$ catalyst for the transesterification of palm oil into biodiesel. Fuel, 153(2015)48-55.
23. **Guanyi Chen,** Jingang Yao, Huijun Yang, Beibei Yan, Hong Chen, Steam gasification of acid-hydrolysis biomass CAHR for clean syngas production. Bioresource Technology, 179(2015)323-330.
24. G.X. Zhou, **G.Y. Chen**, B.B. Yan, Changye Liu, Biodiesel production in a magnetically-stabilized, fluidized bed reactor with an immobilized lipase in magnetic chitosan microspheres. BIOTECHNOLOGY LETTERS, 2014. 36(1): p. 63-68.
25. **Guanyi Chen**, Rui Shan, Jiafu Shi, Beibei Yan, Ultrasonic-assisted producitn of biodiesel from transesterification of palm oil over ostrich eggshell-derived CaO catalysts. Bioresource Technology, 171(2014)428-432
26. **G.Y. Chen**, W. Kong, et al., Hydrodeoxygenation of Guaiacol over Nickel-based Catalyst Supported on Mixed Oxides. CHEMICAL JOURNAL OF CHINESE UNIVERSITIES-CHINESE, 2013. 34(12): p. 2806-2813.
27. **G.Y. Chen**, Z.L Chen, et al., Analysis of the characteristics of heat and mass transfer of a three-effect tubular solar still and experimental research. DESALINATION, 2013.

330: p. 42-48.
28. **G.Y. Chen**, Y. Wang, et al., Experimental study of the bio-oil production from sewage sludge by supercritical conversion process. WASTE MANAGEMENT, 2013. 33(11): p. 2408-2415.
29. **G.Y. Chen**, Baudoin, E., et al., Effect of Partial Premixing on Stabilization and Local Extinction of Turbulent Methane/Air Flames. FLOW TURBULENCE AND COMBUSTION, 2013. 90(2SI): p. 269-284.
30. **G.Y. Chen**, G.X. Yang, et al., Factors affecting the performance of a single-chamber microbial fuel cell-type biological oxygen demand sensor. WATER SCIENCE AND TECHNOLOGY, 2013. 68(9): p. 1914-1919.
31. **G.Y. Chen**, Q.H. Lin, et al., Spillover effect of environmental investment: evidence from panel data at provincial level in China. FRONTIERS OF ENVIRONMENTAL SCIENCE & ENGINEERING, 2012. 6(3): p. 412-420.
32. Q.H.Lin, **G.Y. Chen** and Y.K. Liu, Scale-up of microwave heating process for the production of bio-oil from sewage sludge. JOURNAL OF ANALYTICAL AND APPLIED PYROLYSIS, 2012. 94: p. 114-119.
33. **G.Y. Chen**, Y. Xu, et al., Upgrading of fast pyrolysis liquid fuel from biomass over Ru/gamma-Al2O3 catalyst. ENERGY CONVERSION AND MANAGEMENT, 2012. 55: p. 172-177.
34. **G.Y. Chen**, and L.X. Zhao, Preliminary investigation on hydrogen-rich gas production by co-steam-reforming of biomass and crude glycerin. INTERNATIONAL JOURNAL OF HYDROGEN ENERGY, 2012. 37(1): p. 765-773.
35. Q.H. Lin, H. Cheng and **G.Y. Chen**, Preparation and characterization of carbonaceous adsorbents from sewage sludge using a pilot-scale microwave heating equipment. JOURNAL OF ANALYTICAL AND APPLIED PYROLYSIS, 2012. 93: p. 113-119.
36. **G.Y. Chen**, C.Y. Liu, et al., Characteristics of oxy-fuel combustion in gas turbines. APPLIED ENERGY, 2012. 89(1): p. 387-394.
37. **G.Y. Chen**, J.X. Peng, et al., Different Methods for Evaluating Pinewood Sawdust Pyrolysis Kinetics by Thermogravimetry Mass Spectrum Analysis. JOURNAL OF BIOBASED MATERIALS AND BIOENERGY, 2011. 5(3SI): p. 324-330.
38. **G.Y. Chen**, B. Yan, et al., Experimental and modeling study of laminar burning velocity of biomass derived gases/air mixtures. INTERNATIONAL JOURNAL OF HYDROGEN ENERGY, 2011. 36(5): p. 3769-3777.
39. **G.Y. Chen**, Y.J.Hu, et al., Controlled combustion tests and bottom ash analysis using household waste with varying composition. WASTE MANAGEMENT, 2011. 31(2SI): p. 259-266.

40. **G.Y. Chen**, W.C. Ma, et al., Chlorine characterization and thermal behavior in MSW and RDF. JOURNAL OF HAZARDOUS MATERIALS, 2010. 178(1-3): p. 489-498.
41. **G.Y. Chen**, B. Yan, et al., Structures and stabilization of low calorific value gas turbulent partially premixed flames in a conical burner. EXPERIMENTAL THERMAL AND FLUID SCIENCE, 2010. 34(3SI): p. 412-419.
42. **G.Y. Chen**, C. Liu, et al., Structures and burning velocity of biomass derived gas flames. INTERNATIONAL JOURNAL OF HYDROGEN ENERGY, 2010. 35(2): p. 542-555.
43. Xun Li, Zhiming Zhou, Dan Xie, **Guanyi Chen,** Preparation of acetol from crude glycerol of biomass-based via catalytic reactive distillation. ACTA ENERGIAE SOLARIS SINICA, 2009.30(9): p.1159-1162
44. Xiangmei Meng, **Guanyi Chen**, Yonghong Wang, Biodiesel production from waste cooking oil via alkali catalyst and its engine test. Fuel Processing Technology, 2008.89(9):p.851-857

## External Experiences

Academic Visiting and Exchange to more than 100 universities/research institutes abroad, including: University of California at Berkeley, Washington State University, University of California at Davis and Los Angle, National Renewable Energy Lab (USA); Lund University, Stockholm University (Sweden); Delft University of Technology, Leiden University, Netherlands Energy Research Centre (the Netherlands); Perugia University (Italy); Aalborg University, Technical University of Denmark (Denmark); Technical University of Vienna (Austria), Technical University of Berlin (Germany), University of Nantes (France), University of South Australian and University of Adelaide (Australia), University of Auckland (New Zealand), Incheon National University (Korea), University of Tsukuba (Japan), Indian Institute of Technology (India), and ChiangMai University (Thailand) etc.