



Liuyun LI, Ph.D.

Assistant Professor

Program: Advanced Materials Science and Technology

Area: Applied Chemistry and Chemical Engineering

Undergraduate: Dept. of Engineering

Professional Expertise

My professional expertise is tar decomposition, biomass/waste gasification and low-cost catalyst development. Solid fuel resources gasification is conducted at relatively low temperatures around 600°C. Hydrogen-rich fuel gases are obtained as production gases. Low-cost and high-activity catalysts are developed by using low grade metals, low rank coal and natural ores.

Research Fields of Interest

- **Catalytic conversion of solid fuels**
Low temperature gasification of coal, biomass and waste
Hydrogen-rich gas production
- **Fluidized bed conversion technologies for solid fuels**
Fluidized bed gasification and combustion technologies
Emission control of N-containing compounds
- **Catalyst development and catalyst characterization**
Catalyst preparation using ion-exchange method
Low grade metals utilization
Production of fine particles, functional materials

(Process concept is schematically shown in figure)

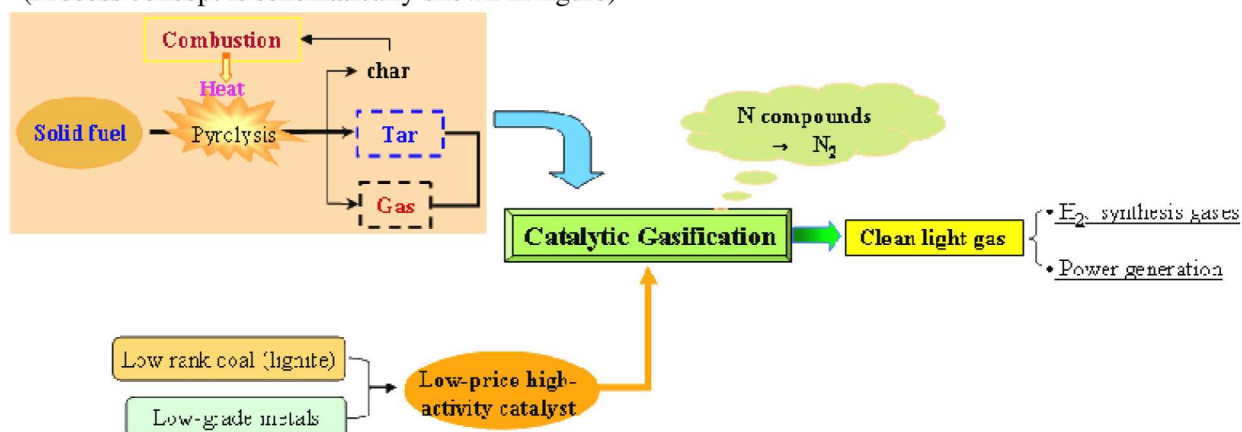


Figure: Process concept of solid fuel conversion

Education

2007: Ph.D. (Engineering), Production Engineering, Faculty of engineering, Gunma University, Japan

2003: Master Eng., Department of Biological and Chemical Engineering, Faculty of engineering, Gunma University, Japan

1999: Bachelor Eng., Department of Chemical Engineering, China University of Mining and Technology, China

Professional Societies and Activities

Member of the Society of Chemical Engineers, Japan

Major Publications

Papers

- [1] "Nitrogen transformations during fast pyrolysis of sewage sludge" , *Fuel*, in Press (2011)
- [2] "Low-Temperature Gasification of a Woody Biomass under a Nickel-Loaded Brown Coal Char" , *Fuel Processing Technology*; 91,889-894, 2010
- [3] "Triacetoneamine formation in a bio-oil from fast pyrolysis of sewage sludge using acetone as the absorption solvent" , *Bioresource Technology* 101, 4242-4245, 2010
- [4] "Catalytic steam gasification of biomass in fluidized bed at low temperature: Conversion from livestock manure compost to hydrogen-rich syngas" , *BIOMASS AND BIOENERGY* vol.34 (2010) pp.1505-1512
- [5] "Multi-stage biomass gasification in Internally Circulating Fluidized-bed Gasifier (ICFG): Test operation of animal-waste-derived biomass and parametric investigation at low temperature" , *Fuel Processing Technology*, Volume 91, Issue 8, August 2010, Pages 895-902
- [6] "Development of a Ni-Loaded Brown Coal Char Catalyst for Fluidized Bed Biomass Gasification at Low Reaction Temperatures" , *J CHEM ENG JPN*, 43 (5), 443-450, 2010
- [7] "Development of Catalytic Tar Decomposition in an Internally Circulating Fluidized-Bed Gasifier" , *Proc. of the 20th International Conference on Fluidized Bed Combustion*, PP. 747-753, (2009) ISBN 978-3-642-02681-2, Tsinghua University Press
- [8] "Catalytic Activity of Coal Char on Water-Gas Shift Reaction" , *J CHEM ENG JPN*, Vol. 42, 153-159 (2009)
- [9] Investigation on Deactivation and Regeneration of a Commercial Ni/Al₂O₃ Catalyst in Coal Volatile Decomposition, *J CHEM ENG JPN*, 41 (9), 915-922, (2008)
- [10] "Two-Stage Fluidized Bed Gasification of Manure Compost at Low Temperature and the Operation of a Small Pilot Internally Circulating Fluidized-Bed Gasifier (ICFG)" , *Circulating Fluidized Bed Technology IX*, PP.655-660, (2008)
- [11] "Light Fuel Gas Production from Nascent Coal Volatiles Using a Natural Limonite Ore" , *Fuel*; 86 (10/11) 1570-1576, (2007)
- [12] "Conversion of Hot Coke Oven Gas into Light Fuel Gas over Ni/Al₂O₃ Catalyst" , *J CHEM ENG JPN*, 39 (4), 461-468, (2006)
- [13] "Thermal Release and Catalytic Removal of Organic Sulfur Compounds from Upper Freeport Coal" , *Energy & Fuels*, 19(2); 339-342 (2005)
- [1] Heat recovery from melted blast furnace slag using fluidized bed – A fundamental study using cold model – , Fluidization 10th Science and Technology China-Japan Symposium, Tokyo, Japan (Nov, 2010)
- [2] Low-Temperature Gasification of Livestock Compost under Prepared Ni-Loaded Brown Coal Char, 10th Japan-China Symposium on Coal and C1 Chemistry, Tsukuba, Japan (Jul 2009)
- [3] Nitrogen Transformations during Fast Pyrolysis of Sewage Sludge, 10th Japan-China Symposium on Coal and C1 Chemistry, Tsukuba, Japan (Jul 2009)
- [4] Development of Catalytic Tar Decomposition in an Internally Circulating Fluidized-Bed Gasifier, the 20th International Conference on Fluidized Bed Combustion, Xi'an, China (May 2009)
- [5] Low-Temperature Gasification of Swine Compost Tar Using Ni-Loaded Brown Coal as a Catalyst, Mexican Congress on Chemical Reaction Engineering, Ixtapa-Zihuatanejo, Mexico (Jun 2008)
- [6] Design, construction and test operation of internally circulating fluidized-bed gasifier (ICFG) , Mexican Congress on Chemical Reaction Engineering, Ixtapa-Zihuatanejo, Mexico (Jun 2008)
- [7] Two-Stage Fluidized Bed Gasification of Manure Compost at Low Temperature and the Operation of a Small Pilot Internally Circulating Fluidized-Bed Gasifier (ICFG), 9th International Conference on Circulating Fluidized Beds, Hamburg, Germany (May 2008)
- [8] The 4th Joint China/Japan Chemical Engineering Symposium, Chengdu, China, (Dec 2007)
- [9] Carbon Deposition from C₆-hydrocarbons on Ni/Al₂O₃, The 2nd Gunma International Symposium on Chemistry, Kiryu, Japan (Jul 2007)
- [10] Catalytic hydropyrolysis of coke oven tar for production of light hydrocarbon liquid, Proc. 9th China-Japan Symposium on Coal and C1 Chemistry, Chengdu, Japan (Oct 2006)
- [11] High-BTU Gas Production from Tar-Bearing Hot Coke Oven Gas over Iron Catalyst, Proc. 2005 International Conference on Coal Science and Technology, Okinawa, Japan (Oct 2005)
- [12] Decomposition of tarry material in COG by catalyst, Proc. 8th JPN-CHN Symposium on Coal and C1 Chemistry, Kitakyushu, Japan (Dec 2003)
- [13] Effect of Steam Addition on Decomposition of Tarry Material in COG by Ni Catalyst, Proc. 12th International Conference on Coal Science, Cairns, Australia (Dec 2003)