



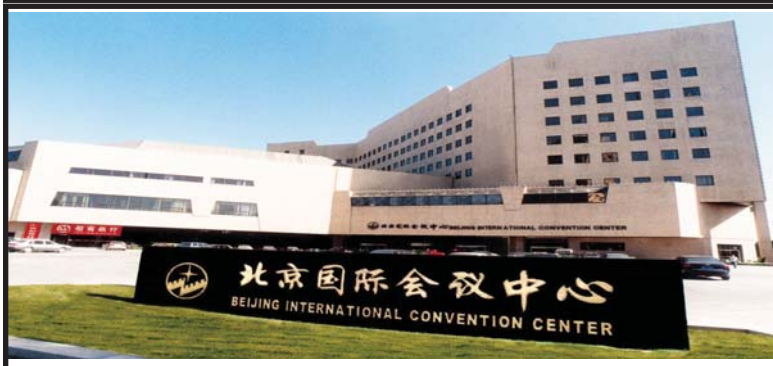
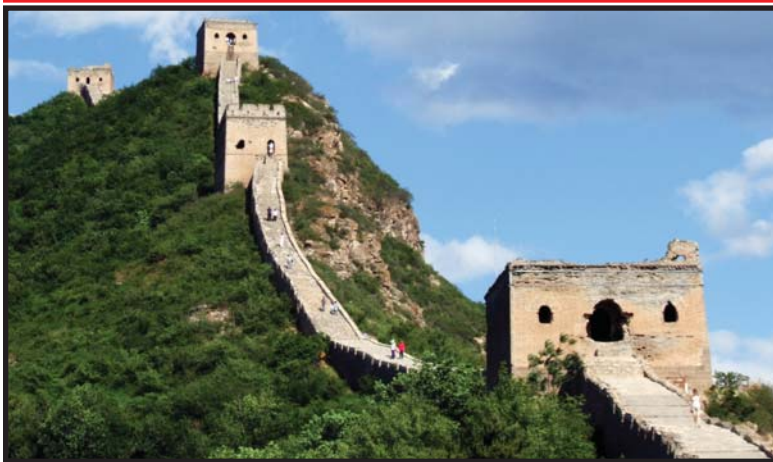
THIRTIETH ANNUAL INTERNATIONAL PITTSBURGH COAL CONFERENCE

FINAL PROGRAM

COAL - ENERGY, ENVIRONMENT AND SUSTAINABLE DEVELOPMENT



September 15 - 18, 2013
Beijing, CHINA
Beijing International Convention Center



Hosted By:



The Division of Energy and Mining Engineering of
Chinese Academy of Engineering

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北京低碳清洁能源研究所
NATIONAL INSTITUTE OF CLEAN-AND-LOW-CARBON ENERGY

National Institute of Clean-and-Low-Carbon Energy



University of Pittsburgh
Swanson School of Engineering

Welcome to the 30th Annual International Pittsburgh Coal Conference!

The International Pittsburgh Coal Conference (PCC) is the “premier” annual event focusing on all aspects of coal, energy, environment and sustainable development. It provides a unique forum for in-depth exchange of technical information and policy issues among all participants from industry, government and academia throughout the world. China has made significant strides and progress on coal utilization and related industries, such as coal power plants and coal to liquids and chemicals. The PCC committees kindly welcome you to attend this important event in Beijing. Below are few details about this year’s conference.

Conference Theme: Environmental issues and technologies surrounding the continued clean coal utilization and the development of coal-based energy and fuels to meet future energy market.

Organized by: International Pittsburgh Coal Conference, University of Pittsburgh, USA

Hosted by: - The Division of Energy and Mining Engineering of Chinese Academy of Engineering
-National Institute of Clean & Low Carbon Energy (NICE)

Conference Chair: **Dr. Yuzhuo Zhang**, President & CEO of Shenhua Group, Member of Chinese Academy of Engineering (CAE), (China)

Conference Executive Director: **Prof. Badie Morsi**, Member of Advisory Board, International Pittsburgh Coal Conference, University of Pittsburgh, USA

Advisory Committee Chair: Prof. Kechang Xie, Vice President of Chinese Academy of Engineering (CAE), Member of CAE, (China)

Advisory Committee Members:

Prof. Jinghai Li, Vice president, Chinese Academy of Science, Member of CAS, (China)

Dr. Qili Huang, Director of Division of Energy and Mining Engineering of CAE, Member of CAE, (China)

Prof. Heping Xie, Chancellor of Sichuan University, Member of CAE, (China)

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Prof. Weidou Ni, Former Vice President of Tsinghua University, Member of CAE, (China)

Prof. Kefa Cen, Director of Energy Institute, Zhejiang University, Member of CAE, (China)

Prof. Yukun Qin, Harbin Inst. Of Technology, Member of CAE, (China)

Prof. Suping Peng, China Univ. of Mining & Technology (Beijing), Member of CAE, (China)

Prof. Qingtang Yuan, Chief Engineer of Sinopec Group, Member of CAE, (China)

Prof. Guangxi Yue, Tsinghua University, Member of CAE, (China)

Prof. Jiongtian Liu, President of Zhengzhou University, Member of CAE, (China)

Prof. Liang Yuan, Executive Deputy General Manager & Chief Engineer Of Huainan Mining Industry (Group) Co. Ltd., Member of CAE (China)

Mr. Jon Michael Davis, President & CEO of National Institute of Clean & Low Carbon Energy, (China)

Mr. Robert Beck, National Coal Council, (USA)

Mr. Richard (Dick) Winschel, CONSOL Energy Inc., (USA)

Prof. Shiao-Hung Chiang, University of Pittsburgh, (USA)

Prof. Güven Onal, (Turkey)

Prof. Kouichi Miura, Kyoto University, (Japan)

Dr. Johan van Dyk, (South Africa)

Prof. Chunshan Song, Penn State University, (USA)

Organizing Committee Chairs: Dr. Ke Liu, Prof. Badie Morsi, Dr. Dazhao Gu, Dr. Wenhua Li

Organizing Committee Members:

Dr. Shisen Xu, President of Huaneng Clean Energy Research Institute, (China)
Prof. Shaozeng Sun, Harbin Institute of Technology, (China)
Dr. Qiwen Sun, Yankuang Group Co.,Ltd., (China)
Prof. Mengxiang Fang, Zhejiang University, (China)
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Prof. Xiaoxun Ma, Northwest University, (China)
Prof. Zhenyu Liu, Beijing University of Chemical Technology, (China)
Prof. Xinzhe Lan, Metallurgical Engineering Technology Research Centre of Shaanxi Province
Dr. Hongpu Kang, CCRI, (China)
Prof. Dongxiao Zhang, Peking University, (China)
Mr. Richard (Dick) Winschel - CONSOL Energy Inc., (USA)
Mr. Gary Stiegel, U.S. DOE/NETL, (USA)
Dr. Evan Granite U.S. DOE/NETL, (USA)
Prof. Jim Hower, University of Kentucky, (USA)
Dr. Francis Lau, Synthesis Energy Systems, (USA)
Mr. Vann Bush, Gas Technology Institute, (USA)
Mr. Steven Carpenter, (USA)
Prof. Kouichi Miura, Kyoto University, (Japan)
Dr. Johan van Dyk, (South Africa)

International Program Committee Members

Dr. Ke Liu, (China), Chair
Mr. Gary Stiegel, (USA), Co-Chair
Dr. Evan Granite, (USA), Co-Chair
Prof. Jim Hower, (USA), Co-Chair
Dr. Dazhao Gu (China), Co-chair
Prof. Chunshan Song, (USA)
Dr. Steve Xiao, (USA)
Dr. Johan van Dyk, (South Africa)
Mr. Jon Michael Davis, (China)
Dr. Wenhua Li, (China)
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Dr. Francis Lau, (USA)
Prof. Güven Onal, (Turkey)
Dr. Leslie Ruppert, (USA)
Prof. Kouichi Miura, (Japan)
Mr. Steven Carpenter, (USA)
Prof. Tarunjit Butalia, (USA)
Dr. Massood Ramezan, (USA)
Ms. Tina Vital, (USA)
Mr. Richard (Dick) Winschel, (USA)

WELCOME!

On behalf of the Conference Advisory Board, Conference Committees, and the University of Pittsburgh we welcome you to the Thirtieth Annual International Pittsburgh Coal Conference held September 15 - 18 at the Beijing International Convention Center in Beijing, China. The Conference is hosted by the University of Pittsburgh.

The theme of this year's conference is "Coal - Energy, Environment and Sustainable Development" which covers a wide spectrum of important topics on coal technology, synfuel and environmental issues. The topics cover energy and environmental issues and technologies related to coal and its byproducts. Over 300 technical papers and posters will be presented throughout the conference. The Poster Sessions will be held on Monday, September 16 from 19:30 - 21:00. For detailed information on technical sessions, papers and speakers, please turn to page 8 in the Technical Program.

The invited Plenary Speakers include: Dr. Yuzhuo Zhang, President and CEO of Shenhua Group, Member of Chinese Academy of Engineering, CHINA; Mr. Richard A. (Dick) Winschel, Director, Research Services, CONSOL Energy Inc., R&D, USA; Prof. Guangxi Yue, Tsinghua University, Member of Chinese Academy of Engineering, CHINA; Prof. Guven Onal, President of Turkish Mining Development Foundation, Istanbul Technical University, TURKEY; Prof. Kechang Xie, Vice President, Chinese Academy of Engineering, Member of Chinese Academy of Engineering, CHINA; and Mr. Thomas A. Sarkus, Division Director, Office of Major Demonstrations, Strategic Center for Coal, NETL, U.S. Department of Energy, USA.

We express our sincere gratitude to the contributors for their support and involvement, to all the authors and co-authors of the technical papers and to all the members of the Program Committee, Awards Committee, International Committee and Membership Committee. Special thanks go to our Technical Program Chairs, as well as to all session chairs, speakers and international delegates for their contributions to the 2013 technical program.

As the chair and vice chair of the Advisory Board of the Conference, we deeply appreciate your participation and interest in this year's Conference and we invite you to join us next year for the Thirty-First Annual International Pittsburgh Coal Conference, which will be held in Pittsburgh, PA from October 6 - 9, 2014.

Sincerely,



Robert Beck, Chair
The National Coal Council, Inc., Washington, DC, USA



Richard Winschel, Vice -Chair
CONSOL Energy Inc., Pittsburgh, PA, USA

TECHNICAL TOUR:**NICE**

(National Institute of Clean-and-Low-Carbon Energy)

Tuesday, September 17, 2013

Free to all PCC Attendees

Group One (Last name starts A-L):

Assemble at lobby of Beijing International Convention Center,
leave for NICE at 16:15
17:00 - Start NICE tour
18:00 - Go to restaurant

Group Two (Last Name starts M-Z):

Assemble at lobby of Beijing International Convention Center,
leave for NICE at 16:45
17:30 - Start NICE tour
18:30 - Go to restaurant

Both Groups:

18:50 - Dinner
20:20 - Complete dinner, back to Beijing International Convention Center

TECHNICAL TOUR:

Visit Manufacture Control Center of Shenhua Group

Thursday, September 19, 2013

Free to all PCC Attendees

Group One (Last Name starts A-L):

Assemble at lobby of Beijing International Convention Center
Departure for Shenhua 08:30
Back to Beijing International Convention 10:00

Group Two (Last Name starts M-Z):

Assemble at lobby of Beijing International Convention Center
Departure for Shenhua 09:45
Back to Beijing International Convention 11:15

CONFERENCE OVERVIEW

SUNDAY, SEPTEMBER 15, 2013

Registration	10:00 - 19:00
Cocktail Reception	18:30 - 20:00

MONDAY, SEPTEMBER 16, 2013

Registration	08:00 - 17:00
Opening Ceremony	09:00 - 09:25
Plenary Session – 1	09:25 - 10:45
Concurrent Tech. Sessions	11:00 - 12:40
Conference Luncheon	12:40 - 14:00
Concurrent Tech. Sessions	14:00 - 17:55
Poster Session	19:30 - 21:00

TUESDAY, SEPTEMBER 17, 2013

Registration	08:00 - 17:00
Plenary Session – 2	08:30 - 09:50
Concurrent Tech. Sessions	10:00 - 11:40
Conference Luncheon	11:40 - 12:45
Concurrent Tech. Sessions	12:45 - 16:00
Technical Tour	16:15 - 20:20

WEDNESDAY, SEPTEMBER 18, 2013

Registration	08:00 - 17:00
Plenary Session – 3	08:30 - 09:50
Concurrent Tech. Sessions	10:00 - 11:40
Awards Luncheon	11:40 - 12:55
Concurrent Tech. Sessions	12:55 - 17:15
Advisory Board Meeting	18:00 - 19:30

PLENARY SPEAKERS

MONDAY, SEPTEMBER 16, 2013

Dr. Yuzhuo Zhang

President and CEO of Shenhua Group
Member of Chinese Academy of Engineering
CHINA

“Vertical Integration — The Future of Coal Industry”

Mr. Richard A. (Dick) Winschel

Director, Research Services
CONSOL Energy Inc., R&D
USA

“CONSOL Energy and the States of the U.S. Coal Mining and Coal-Fired Electric Generation Industries”

TUESDAY, SEPTEMBER 17, 2013

Prof. Guangxi Yue

Tsinghua University
Member of Chinese Academy of Engineering
CHINA

“Circulating Fluidized Bed Combustion and Coal Slurry Gasification”

Prof. Güven Onal

President of Turkish Mining Development Foundation
Istanbul Technical University
TURKEY

“Coal and Coal-Based Energy in Turkey”

WEDNESDAY, SEPTEMBER 18, 2013

Prof. Kechang Xie

Vice President, Chinese Academy of Engineering
Member of Chinese Academy of Engineering
CHINA

“The Strategic Thinking of Sustainable Development of Coal Industry and High Efficiency and Clean Conversion of Coal in China”

Mr. Thomas A. Sarkus

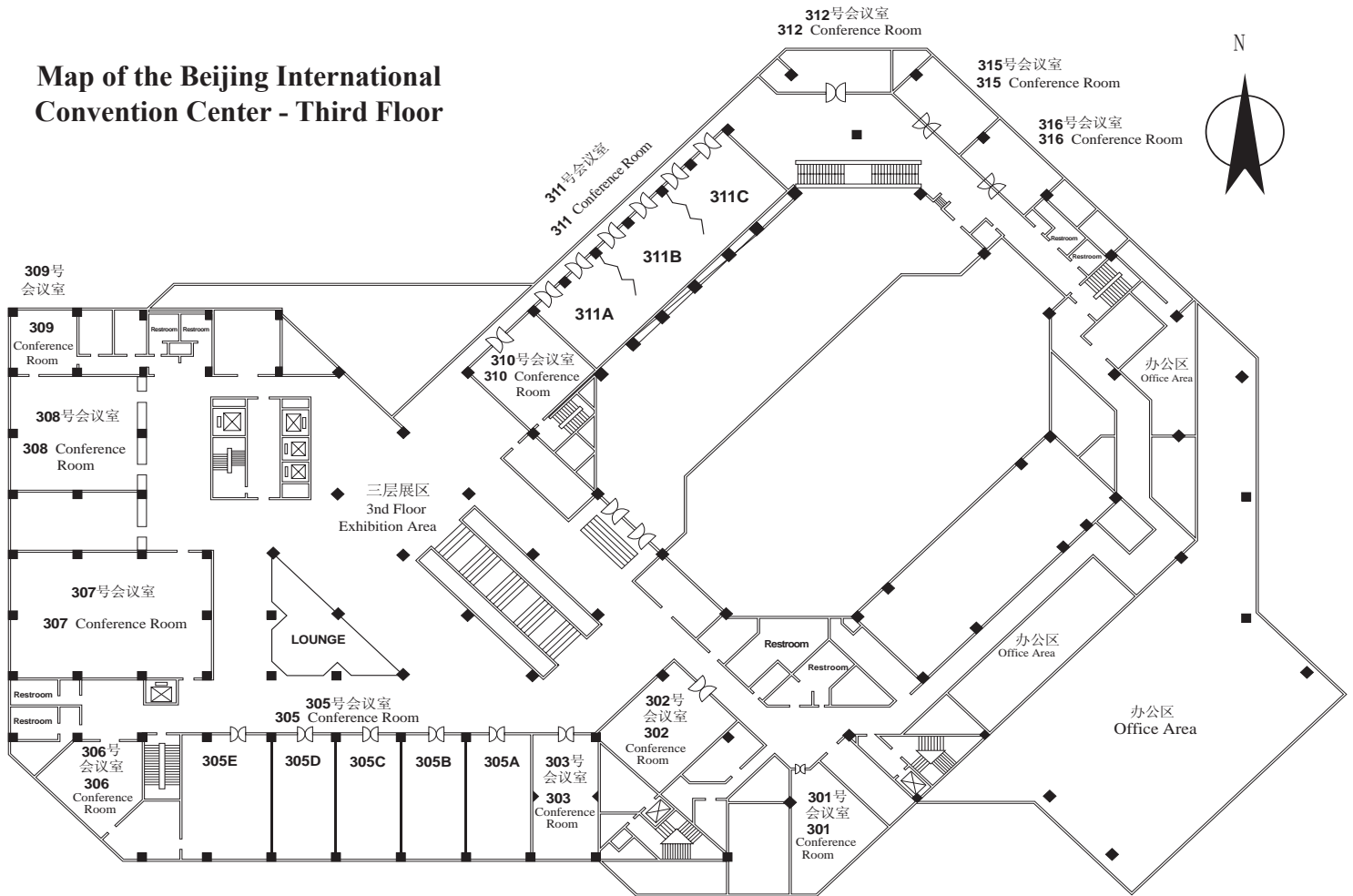
Division Director, Office of Major Demonstrations,
Strategic Center for Coal
NETL, US-DOE
USA

“Lessons Learned from U.S. Government Support of Clean Coal Technologies”

Sunday, September 15, 2013						
10:00-19:00	Registration – Second Floor Lobby of the Convention Center					
18:30-20:00	Reception – Banquet Hall on the 2nd floor of the North Star Continental Grand Hotel					
Monday, September 16, 2013						
8:00-17:00	Registration – Room 310					
9:00-9:25	Opening Ceremony – Convention Hall No. 1					
9:25-10:45	Plenary Session – Convention Hall No. 1					
10:45-11:00	Coffee Break					
ROOM	305 (A+B)	305 C	311 (A+B)	305 E	308	305 D
	Session 1	Session 2	Session 3	Session 4	Session 5	Session 6
11:00-12:40	Coal Science: General - 1	Coal Mining: Ground Control in Mining Session 1	Gasification: General - 1	Clean Coal and Gas to Fuels: General - 1	Shale and Coal Bed Gas: General - 1	Clean Coal Demonstration and Commercial Projects General - 1
12:40-14:00	Conference Luncheon – Banquet Hall on the Second floor of the North Star Continental Grand Hotel					
	Session 7	Session 8	Session 9	Session 10	Session 11	Session 12
14:00-15:40	Coal Science: General - 2	Coal Mining: Ground Control in Mining Session 2	Gasification: General - 2	Clean Coal and Gas to Fuels: General - 2	Shale and Coal Bed Gas: General - 2	Clean Coal Demonstration and Commercial Projects General - 2
15:40-15:55	Coffee Break					
	Session 13	Session 14	Session 15	Session 16	Session 17	Session 18
15:55-17:55	Coal Science: General - 3	Coal Mining: Environmental Hazards, Remediation and Control	Gasification: General - 3	Clean Coal and Gas to Fuels: General - 3	Shale and Coal Bed Gas: General - 3	Clean Coal Demonstration and Commercial Projects General - 3
19:30-21:00	Poster Session – Third Floor Exhibition Area					
Tuesday, September 17, 2013						
8:00-17:00	Registration – Room 310					
8:30-9:50	Plenary Session – Convention Hall No. 1					
9:45-10:00	Coffee Break					
ROOM	305 (A+B)	305 C	311 (A+B)	305 E	308	305 D
	Session 19	Session 20	Session 21	Session 22	Session 23	Session 24
10:00-11:40	Coal Science: General - 4	Coal Mining: Monitoring and Controlling Gas in Mines	Gasification: General - 4	Clean Coal and Gas to Fuels: General - 4	Carbon Management: General - 1	Combustion: Combustion Studies
11:40-12:45	Conference Luncheon – Banquet Hall on the Second floor of the North Star Continental Grand Hotel					
	Session 25	Session 26	Session 27	Session 28	Session 29	Session 30
12:45-14:25	Coal Science: General - 5	Coal Mining: Safety, Economics and Mining Technology	Gasification: General - 5	Clean Coal and Gas to Fuels: General - 5	Carbon Management: General - 2	Combustion: Modelling Studies
14:25-14:40	Coffee Break					
	Session 31	Session 32	Session 33	Session 34	Session 35	Session 36
14:40-16:00	Coal Science: General - 6	Sustainability and Environment: General - 1	Gasification: General - 6	Clean Coal and Gas to Fuels: General - 6	Carbon Management: General - 3	Combustion: NOx Studies
16:15-20:20	Technical Tour –NICE – Meet in the Lobby of the Convention Center					
Wednesday, September 18, 2013						
8:00-17:00	Registration – Room 310					
8:30-9:50	Plenary Session – Convention Hall No. 1					
9:45-10:00	Coffee Break					
ROOM	305 (A+B)	305 C	311 (A+B)	305 E	308	305 D
	Session 37	Session 38	Session 39	Session 40	Session 41	Session 42
10:00-11:40	Coal Science: General - 7	Sustainability and Environment: General - 2	Gasification: General - 7	Clean Coal and Gas to Fuels: General - 7	Carbon Management: General - 4	Combustion: Ash and Mercury
11:40-12:55	Awards Luncheon – Convention Hall No. 1, Second Floor of the Convention Center					
	Session 43	Session 44	Session 45	Session 46	Session 47	Session 48
12:55-14:55	Coal Science: General - 8	Sustainability and Environment: General - 3	Gasification: General - 8	Clean Coal and Gas to Fuels: General - 8	Gasification: General - 10	Combustion: Oxy-Combustion & Chemical Looping - 1
14:55-15:15	Coffee Break					
	Session 49	Session 50	Session 51	Session 52	Session 53	Session 54
15:15-17:15	Coal Science: General - 9	Sustainability and Environment: General - 4	Gasification: General - 9	Clean Coal and Gas to Fuels: General - 9	Gasification: General - 11	Combustion: Oxy-Combustion & Chemical Looping - 2
18:00-19:30	Advisory Board Meeting – Bei Chen Hall, North Star Continental Grand Hotel					

Beijing International Convention Center

Map of the Beijing International Convention Center - Third Floor



SESSION MEETING ROOMS

Room 305 (A+B)

Sessions 1, 7, 13, 19, 25, 31, 37, 43, 49

Room 305 C

Sessions 2, 8, 14, 20, 26, 32, 38, 44, 50

Room 311 (A+B)

Sessions 3, 9, 15, 21, 27, 33, 39, 45, 51

Room 305 E

Sessions 4, 10, 16, 22, 28,
34, 40, 46, 52

Room 308

Sessions 5, 11, 17, 23, 29,
35, 41, 47, 53

Room 305 D

Sessions 6, 12, 18, 24, 30,
36, 42, 48, 54

Registration

Sunday - Second Floor Lobby
Monday - Wednesday - Room 310

Sunday Evening Reception

Banquet Hall on the Second Floor of the North Star Continental Grand Hotel

Opening Ceremony

Convention Hall No. 1
Second Floor of the Convention Center

Plenary Sessions

Convention Hall No. 1
Second Floor of the Convention Center

Conference Luncheons

Monday and Tuesday - Banquet Hall on the Second floor of the North Star Continental Grand Hotel

Wednesday - Convention Hall No. 1
Second Floor of the Convention Center

Poster Presentations

Third Floor Exhibition Area

Exhibits

Third Floor Exhibition Area

ORAL SESSIONS

Monday, September 16, 2013

SESSION 1 COAL SCIENCE: GENERAL - 1

Kouichi Miura and Wenhua Li

Effect of Grinding Medium on the Surface Chemical Property and Flotation Behavior of Coal Middlings, Weining Xie, Yaqun He, Tao Zhang, Linhan Ge, Xiangnan Zhu, Shan Wu, Hong Li, China University of Mining and Technology, CHINA

Mercury and Fluorine in the Late Permian Coals from Eastern Yunnan Province, China, Xibo Wang, Lei Zhao, Shifeng Dai, State Key Laboratory of Coal Resources and Safe Mining, CHINA

Deformation-Metamorphism Characteristics of Coal and the Corresponding Energy Changing Process, Yiwen Ju, Xiaoshi Li, Guochang Wang, Mingming Wei, University of Chinese Academy of Sciences, CHINA

Mercury Removal Technology, Today and Tomorrow, Robert Nebergall, Cabot Norit Activated Carbon, USA

Thermal Analysis of Chinese Lignite Pyrolysis Using Thermogravimetry and Differential Scanning Calorimetry, Zhihang Guo, Qinhui Wang, Zhongyang Luo, Kefa Cen, Zhejiang University, CHINA

SESSION 2 COAL MINING:

GROUND CONTROL IN MINING - SESSION 1

Dazhao Gu and Richard Bajura

Development and Applications of Rock Bolting Materials for Coal Mine Roadways, Hongpu Kang, Jian Lin, Yongzheng Wu, China Coal Research Institute, CHINA

Experiments on Effects to Rock Bolt Pretension by Thread Rolling Accuracy, Yan Lixin, China Coal Research Institute, CHINA

Simulation Analysis of the Bolt Support in Inclined Shaft Through the Soft Rock Strata, Pengfei Jiang, Tiandi Science & Technology Co, Ltd., CHINA

Technology Research on Weakly-Cemented Sandstone Roadway Supporting in Lignite Coal Mine and its Application, Fan Mingjian, Tiandi Science & Technology Co. Ltd, CHINA

Research on Testing and Comprehensive Assessment Methods of Coalmine Goaf Treatment Effect, Zhang Gang-yan, Tiandi Science & Technology Co., Ltd., CHINA

SESSION 3 GASIFICATION: GENERAL - 1

Fuchen Wang and Johan Van Dyk

State of the Gasification Industry – the Updated Worldwide Gasification Database, Chris Higman, Higman Consulting GmbH, GERMANY

Modeling of Coal Gasification in a Low-Temperature, High-Pressure Entrained-Bed Reactor, Ming-Hong Chen, Yau-Pin Chyou, Institute of Nuclear Research, Atomic Energy Council, TAIWAN; Ting Wang, University of New Orleans, USA

Dry Solids Pump Program Status, Alan Darby, Aerojet Rocketdyne, USA

ITM Oxygen Technology for Clean Energy Applications, Andrew Mak, Edward P. (Ted) Foster, Phillip A. Armstrong, John M. Repasky, VanEric E. Stein, Air Products and Chemicals, Inc., USA

Enhanced Hydrogen Production from Steam Gasification of Coal with In-Situ CO₂ Capture in a Pressurized Fluidized Bed, Nai Rong, Qinhui Wang, Hongtao Fan, Yongjie Meng, Zhongyang Luo, Kefa Cen, Zhejiang University, CHINA

SESSION 4 CLEAN COAL AND GAS TO FUELS: GENERAL - 1

Sam Tam and Qi Sun

Application of Selective Fischer-Tropsch Synthesis in CTL and CBTL: Slip-stream Evaluation and Technoeconomic Analysis, Santosh Gangwal, Southern Research Institute, USA

Coliquefaction of Lignite, Wheat Straw and Plastic Waste in Sub-Critical Water, Baofeng Wang, Yaru Huang, Shuguang Zhao, Lirong Li, Jinjun Zhang, Shanxi Normal University, CHINA

Pressure Influence on the Analytical Pyrolysis of Coals, Christian Berndt, Steffen Krzack, Bernd Meyer, TU Bergakademie Freiberg, GERMANY

SESSION 5 SHALE AND COAL BED GAS: GENERAL - 1

Dongxiao Zhang and Dick Winschel

A Next-Generation Simulator for Unconventional Oil/Gas Production, Dongxiao Zhang, Peking University, CHINA

Production Characteristics and Stimulation of Low-To-Moderate Coalbed Methane Producing Well: Taking Hancheng Pilot Area as an Example, Shao Xianjie, Dong Xinxu, Wu Ze, Sun Yubo, Xu Hao, Liu Yingjie, Wang Haiyang, Li Shicai, Yanshan University, CHINA

Production Performance Evaluation Index System Construction of Medium- High Rank CBM Wells, Shao Xianjie, Xu Hao, Dong Xinxu, Sun Yubo, Wu Ze, Liu Yingjie, Li Shicai, Yanshan University, CHINA

SESSION 6 CLEAN COAL DEMONSTRATION AND COMMERCIAL PROJECTS: GENERAL - 1

Thomas Sarkus and Xinzhe Lan

Application of Heat-Carrier-Free Regenerative Rotating Bed Technology on Low-Rank Coal Pyrolysis, Daohong Wu, Pei Pei, Qicheng Wang, Beijing Shenwu Environmental & Energy Technology Co., Ltd, CHINA

US-China Advanced Coal Technology Consortium, US-China Clean Energy Research Center: Research Direction and Program Overview, Jerald J. Fletcher, West Virginia University, USA; Chuguang Zheng, Huazhong University of Science and Technology, CHINA

U.S. Department of Energy's CCS Demonstration Projects, Gary J. Stiegel, Thomas A. Sarkus, DOE/NETL, USA

US-China Efforts on Financing the Texas Clean Energy Project, Cynthia Wang, China International Capital Corporation Limited, CHINA; Eric Redman, Summit Power Group, USA

SESSION 7 COAL SCIENCE: GENERAL - 1

Kouichi Miura and Wenhua Li

Purification of Crude Coal Benzene by Ozonization in Presence of Oxide Catalysts, Zinfer Rishatovich Ismagilov, Ekaterina Sergeevna Mikhaylova, Institute of Coal Chemistry and Material Science SB RAS, RUSSIA

Effects of Heating Rate and AAEM on the Production of NH₃ and HCN during Pyrolysis of Shengli Brown Coal, Shu Zhang, Yanping Bai, Panpan Zheng, Yonggang Wang, Deping Xu, Lei Bai, China University of Mining and Technology (Beijing), CHINA

Mechanism of Interaction between Surfactants and Surface Functional Groups of Jincheng Coal by XPS Analysis, Zhiyuan Yang, Xiaoyuan Ren, Kun Zhang, Xi'an University of Science and Technology; BaoShan Guan, Branch of Langfang of Research Institute of Exploration and Development of Chinese Petroleum, CHINA

Change of Physical Structure and Hydrophilic Oxygen-Containing Functional Groups in the Process of Lignite Drying, Xiaoxia Jing, Xiao Liu, Zhiqiang Li, Yunlong Yang, Liping Chang, Weiren Bao, Taiyuan University of Technology, CHINA

SESSION 8 COAL MINING: GROUND CONTROL IN MINING - SESSION 2

Hongpu Kang and Bruce Sass

Development and Application of Resin Capsules in Chinese Coal Mines, Bin Hu, Coal Mining and Design Branch, China Coal Research Institute, CHINA

Research on the Waterproof Coal Pillar Design for Coal Seam Group Mining Goaf, Yu-jun Zhang, Tiandi Science & Technology Co., Ltd, CHINA

Synthesis Grouting and Anchoring Reinforcement Application in Deep Roadway, Wenzhou Li, China Coal Research Institute, CHINA

Mechanical Site-Monitoring to Shotcrete Layer of Soft Rock Main Roadway Supported by Bolt-Shotcrete, Shulin Fang, Jian Zhang, Hongpu Kang, Tiandi Science & Technology Co, Ltd., CHINA

Study on Backfill-Mining with Aeolian Sand in Coal Mine at Desert Border/ Present Application Status of Coal Backfill in China, Feng Cui, Huaxing Zhang, Pengliang Liu, Tiandi Science & Technology Co., Ltd; Ruimin Feng, China University of Mining & Technology, CHINA

SESSION 9 GASIFICATION: GENERAL - 2

Fuchen Wang and Hong Lu

Experiments and Simulation of Pressurized Ash Agglomerating Fluidized Bed Gasifier, Zheyu Liu, Jiejie Huang, Yitian Fang, Yongqi Zhang, Jiantao Zhao, Yifeng Xu, Institute of Coal Chemistry, Chinese Academy of Sciences, CHINA

Kinetic Studies for CO₂ Gasification of HOK Coke using Thermogravimetric Analyzer, Ziad Abosteif, Stefan Guhl, TU Bergakademie Freiberg, Centre for Innovation Competence Virtuhcon, GERMANY

Alkalis K/Na Migration Rule during Coal and Biomass Co-Pyrolysis Process, Guanghui Hu, Jie Feng, Changchun

Hu, Yuncai Song, Yuhong Qin, Wenying Li, Taiyuan University of Technology, CHINA

Design, Modeling and Characterization of an Entrained Flow Reactor for Pyrolysis/Gasification of Coal and Biomass. Sarma V. Pisupati, The Pennsylvania State University and DOE/NETL; Aime Hilaire Tchabda, Vijayaragavan Krishnamoorthy, Nandakumar Krishnamoorthy, The Pennsylvania State University, USA

Influence of Devolatilisation Conditions on Char Chemical Structure and Intrinsic Reactivity. Daniel G. Roberts, Mark A. Kochanek, David J. Harris, CSIRO Energy Technology; Chun-Zhu Li, Curtin University of Technology, AUSTRALIA; Meijun Wang, Liping Chang, Taiyuan University of Technology, CHINA

**SESSION 10
CLEAN COAL AND GAS TO FUELS:
GENERAL - 2**

Xinzhe Lan and Xiaofen Guo

Carbon Fibers Preparation by Low-Molecular-Weight Fraction Obtained from Low-Rank Coal or Biomass by Degradative Solvent Extraction. Xian Li, Guangqian Luo, Hong Yao, Huazhong University of Science and Technology, CHINA; Kenshiro Okuda, Ryuichi Ashida, Kouichi Miura, Kyoto University, JAPAN

Extraction and Analysis of the Phenolic Compounds from Coal Tar Oils. Changkun Liu, Junpeng Zhao, Xiaofen Guo, Yu Bai, Shuai Zhao, National Institute of Clean-and-Low Carbon Energy, CHINA

Influence of Liquefaction Conditions on Molecular Composition of Coal-Derived Liquids. Toluwanise Adesanwo, Moshfiqur Rahman, Arno De Klerk, Rajenda Gupta, University of Alberta, CANADA

**SESSION 11
SHALE AND COAL BED GAS:
GENERAL - 2**

Mingsheng Luo and Steve Carpenter

An Experimental and Numerical Study of Gas Transport and Imbibition Processes in Coal Matrix. Fengshuang Han, Jianli Yang, State Key Laboratory of Coal Conversion, Institute of Coal Chemistry, Chinese Academy of Sciences; Zhenyu Liu, Beijing University of Chemical Technology, CHINA; Andreas Busch, Shell International Exploration and Production B.V., THE NETHERLANDS; Bernhard M. Krooss, RWTH Aachen University, GERMANY

Methane Adsorption Capacity of Coals: Novel Research by Low-Field NMR. Yanbin Yao, Dameng Liu, China University of Geosciences of Beijing, CHINA

Evaluation of the Coalbed Methane Potential of Coal Reservoirs in Weibei Coalbed Methane Field, Southeastern Ordos Basin, China. Taotao Yan, Dameng Liu, Yanbin Yao, China University of Geosciences, CHINA

Coal Reservoir Fracturing Process and the Acoustic Emission Response Based on the Development of Coalbed Gas. Zhifeng Yan, Yiwen Ju, Quanlin Hou, Xiaoshi Li, Guochang Wang, Liye Yu, University of Chinese Academy of Sciences; Shuheng Tang, China University of Geosciences, CHINA

Why Do We Need a Right Permeability Model for Unconventional Gas Extraction? Jishan Liu, Yan Peng, University of Western Australia, AUSTRALIA

**SESSION 12
CLEAN COAL DEMONSTRATION AND
COMMERCIAL PROJECTS:
GENERAL - 2**

Gary Stiegel and Johan van Dyk

Siemens Coal Gasification Technology. Wang De Hui, Siemens Limited China, CHINA; Frank Hannemann, Siemens Fuel Gasification Technology GmbH & Co. KG, GERMANY

Unlocking Potential Value from Low Rank Coal with TRIG™ Gasification Technology. Qianlin Zhuang, KBR; Kerry Bowers, Southern Generation Technologies, LLC, USA

Recent Development and Deployment of U-GAS. T. Robert Sheng, Synthesis Energy System, Inc. (SES), CHINA

Pre-Commercial Demonstration of High-Efficiency, Low-Cost Syngas Cleanup Technology for Chemical, Fuel, and Power Applications. David L. Denton, Ben Gardner, Raghbir Gupta, Brian Turk, RTI International, USA

MicGAS™ Coal Biotechnology Demonstration of Turkish Coals for Production of Gas and Organic Humic Products. Daman S. Walia, ARCTECH, Inc., USA

**SESSION 13
COAL SCIENCE:
GENERAL - 3**

Kouichi Miura and Wenhua Li

Comparison of Coal Characterization Procedures Performed According to GB and ASTM/ISO Standards. JC van Dyk, Sasol Technology R&D, SOUTH AFRICA; Tao Qiaozhen, Ningxia Laboratory, CHINA

Supercritical Fluid Extraction of Heavy Components of Low Temperature Coal Tar Using N-Pentane Solvent. Guangce Jiang, Xiongchao Lin, Haiyong Zhang, Yonggang Wang, China University of Mining & Technology(Beijing), CHINA

Low Rank Coal Pyrolysis Behaviors and its Semicoke Reactivity. Aiguo Chen, Xianglong Zhao, Peng Gao, Yi Guo, Ke Liu, National Institute of Clean-and-Low Carbon Energy, CHINA

Improving Tar Yield and Quality by Enhancing Heat Transfer and Regulating Gas Flow in Fixed Bed Coal Pyrolysis. Rongcheng Wu, Chun Zhang, Guangwen Xu, State Key Laboratory of Multi-phase Complex Systems, Institute of Process Engineering, Chinese Academy of Sciences, CHINA

**SESSION 14
COAL MINING:
ENVIRONMENTAL HAZARDS, REMEDIATION
AND CONTROL**

Vann Bush and Hongpu Kang

Introduction to Coal Mined Land Reclamation in China. Zhenqi Hu, Wu Xiao, China University of Mining and Technology (Beijing), CHINA

Investigation to Define Treatment Requirements for Acid Mine Drainage during Closure of a Fly Ash Reservoir. Bruce M. Sass, John Seymour, Geosyntec Consultants; Alan R Wood, American Electric Power; J. Brady Gutta, West Virginia University, USA

Study of Rock Burst Hazard Predication Based on Acoustic Emission Monitoring. Yuan-jie Wang,

Chuanpeng Wang, Fabing Chen, China Coal Research Institute and Tiandi Science & Technology Co.; Guiliang Yu, Gansu Huating Coal Electricity Co. Ltd, CHINA

Experimental Relation between Stress, Gas Desorption and Thermal Expansion in Coals. ChunGuang Wang, Shandong University of Science and Technology, CHINA; Jishan Liu, University of Western Australia, AUSTRALIA

Mine Hazards – Assessing the Risk. Tana Levi, Jean Saurat, Guy Boaz, CRL Energy Ltd., NEW ZEALAND; Basil Beamish, CB3Mine Services Ltd., AUSTRALIA

Reaching for Bulk Samples through Aquifers at Thar Coal Fields in Pakistan. Farid A Malik, Forman Christian College (A Chartered University); Muhammad Hanif, University of Lahore; Abid Aziz, Pak Motors Ltd, PAKISTAN

**SESSION 15
GASIFICATION:
GENERAL - 3**

Fuchen Wang and Hong Lu

Experimental Study on Co-Pyrolysis/Gasification of Deoiled Asphalt with Lignite. Qian Zhang, Qingfeng Li, Linxian Zhang, Zhiqing Wang, Yitian Fang, Xuliang Jing Zhongliang Yu, Shuangshuang Song, Institute of Coal Chemistry, Chinese Academy of Sciences, CHINA

The Effect of Drying Temperature on Moisture Resorption Capacity of Lignite. Zhi-bing Chang, Mo Chu, Bang Xu, China University of Mining and Technology (Beijing); Li Ding, Beijing Shenwu Environment & Energy Technology Co., Ltd, CHINA

Experiments on the Riser Exit Configurations in a Cold Dense Transport Bed. Shengdian Wang, Shaojun Yang, Xueyao Wang, Xiang Xu, Yunhan Xiao, Kai Zhao, Chinese Academy of Sciences, CHINA

New Technology of High Concentration Coal Water Slurry (CWS) Preparation Technology from Low Rank Coals and Lignite for CWS Gasification. Baoqing Li, State Key Lab of Coal Conversion, Institute of Coal Chemistry, CAS; Feng He, Yulin Western Coal Technology Research Center, CHINA

Hot-State Experimental Research on a Novel Coal-Based Two-stage Gasification Process. Weilong Jin, Yifei Wang, Yizhou Ren, Key Laboratory of Coal Gasification and Energy Chemical Engineering of Ministry of Education, CHINA

**SESSION 16
CLEAN COAL AND GAS TO FUELS:
GENERAL - 3**

Qiwen Sun and Ke Liu

Techno-Economic Analysis of Jet Fuel Co-Production with Electricity from Coal and Biomass in the Ohio River Valley of the United States, with Capture of CO₂ and Storage via Enhanced Oil Recovery. Eric D. Larson, Robert H. Williams, Princeton University; Robert Wallace, Booz Allen Hamilton, USA; Guangjian Liu, North China Electric Power University, CHINA; Qiang Li, Sinopec Research Institute for Petroleum Processing, CHINA

Modeling Comparison of High Temperature Fuel Cell Fueled with Carbon and Hydrogen. Jun Zhang, Jong-Pil Kim, Ho Lim, Soon-Ho Lee, Chung-Hwan Jeon, Pusan National University, KOREA

Simulation Analysis of Coal to Substitute Natural Gas Process. Bozhao Chu, Le Zhang, Yi Cheng, Tsinghua University, CHINA

Sensitivity Analysis of the Multi-step Reaction Model for CaC₂ Formation from Coal and Lime, Steven L. Rowan, Ismail B. Celik, Jose Antonio Escobar Vargas, Suryanarayana R. Kakalapati, West Virginia University, USA; Matt Targett, LP Amina, CHINA

Methane Production by Hydrogenation of Low-Rank Coal in a Fixed Bed Reactor, Jie Zhang, Haoran Ding, Jie Wang, East China University of Science and Technology, CHINA

**SESSION 17
SHALE AND COAL BED GAS:
GENERAL - 3**

Steve Carpenter and Dick Winschel

Possibilities of Increasing the Effectiveness of Mining Methane Drainage in Conditions of Low Permeability of Coal Seams, Nikodem Szlczak, Dariusz Obracaj, Justyna Swolkien, AGH University of Science and Technology, POLAND

A Tale of Two Mudrocks – Reservoir Quality of the Marcellus Shale and Point Pleasant-Utica in the Appalachian Basin, USA, Timothy R. Carr, West Virginia University, USA

The Impacts of Shale Gas Development on Coal in the U.S. Electricity Industry, Davina Bird, Qingyun Sun, US-China Energy Center at West Virginia University, USA

Integrated Approaches of Conventional Log Suite Interpretation for Unconventional Shale-Gas Reservoir Evaluation, Guochang Wang, Yiwen Ju, University of Chinese Academy of Sciences, CHINA; Timothy R. Carr, West Virginia University, USA

The Main Characteristics Shale Gas Reservoir and its Effect on the Reservoir Reconstruction, Hongling Bu, Yiwen Ju, Guochang Wang, University of Chinese Academy of Sciences, CHINA

Production Analysis of Desorption in Shale Gas Development, Tingyun Yang, Dongxiao Zhang, Xiang Li, Peking University, CHINA

**SESSION 18
CLEAN COAL DEMONSTRATION AND
COMMERCIAL PROJECTS:
GENERAL - 3**

Thomas Sarkus and Li Zheng

Development of Coal Pyrolysis and Combustion Poly-generation System, Zhongyang Luo, Mengxiang Fang, Qinhui Wang, Mingjiang Ni, Kefa Cen, Zhejiang University, CHINA

Advanced Ultra-Supercritical Steam Power Plants, John Marion, ALSTOM Power, Inc., USA; Christophe Frappart, ALSTOM Power Systems SA, FRANCE; Frank Kluger, ALSTOM Power Systems GmbH, GERMANY; Michael Sell, Adrian Skea, ALSTOM Power (Switzerland) Ltd., SWITZERLAND; Rod Vanstone, ALSTOM Power (UK) Ltd., UNITED KINGDOM

FutureGen 2.0: Commercial-Scale Oxy-Combustion Plant Advances Toward Construction, Kenneth K. Humphreys, FutureGen Alliance, Inc., USA

Demonstration of Coal Refining (COALREF®) Technology in Commercial Scale, Cliff Y. Guo, Qiang Qin, Hong Lu, Changning Wu, Ke Liu, National Institute of Clean-and-low-carbon Energy, CHINA

Performance Prediction of a Pyrolysis Bridged Hybrid Power System, Yuzhe Li, Wenli Song, Chinese Academy of Sciences, CHINA

**ORAL SESSIONS
Tuesday, September 17, 2013**

**SESSION 19
COAL SCIENCE:
GENERAL – 4**

Zhenyu Liu and Aiguo Chen

Effect of Sodium Carbonate Additive on the Activation of Coal Wastes for Alumina Extraction, Yanxia Guo, Kezhou Yan, Yaoyao Li, Fangqin Cheng, Shanxi University, CHINA

Effect of Heating Temperature and Additives on the Transformation of Alkali Metals in Zhundong Coal with High Sodium Content, Xuebin Wang, Limeng Zhang, Bo Wei, Houzhang Tan, Tao Yang, Zhongfa Hu, Xi'an Jiaotong University, CHINA

Process Analysis on Co-Pyrolysis of Lignite and Residue from Shendong Coal Direct Liquefaction, Yanli Xue, Xiaohong Li, Xiaoyong Xue, Qun Yi, Jie Feng, and Wenying Li, Taiyuan University of Technology; Xiaofen Guo, Ke Liu, NICE, CHINA

**SESSION 20
COAL MINING:
MONITORING AND CONTROLLING GAS IN
MINES**

Richard Bajura and Dazhao Gu

Mining Methane Drainage in Polish Coal Mines, Nikodem Szlczak, Dariusz Obracaj, AGH University of Science and Technology, POLAND

A Novel Technology to Control the Quality of Pre-Mining Methane Drainage, Fubao Zhou, Tongqiang Xia, Shengyong Hu, Haijian Li, China University of Mining & Technology; Mingyao Wei, Chinese Academy of Sciences, CHINA; Jishan Liu, University of Western Australia, AUSTRALIA

The Global Methane Initiative and its Role in Increasing Coal Mine Methane Recovery and Use, Felicia Ruiz, Coalbed Methane Outreach Program, EPA; Clark Talkington, Advanced Resources International, Inc., USA

Micro-Seismic Monitoring for Uncontrolled Gas Emissions in Underground Coal Mining, Guangyao Si, Ji-Quan Shi, Sevket Durucan, Imperial College London, UNITED KINGDOM

Field Performance of Alternate Mining Geometries for Set-Up Rooms and Development Entries in Longwall Mining, Yoginder P. Chugh, Harrold Gurley, Behrooz Abbasi, Southern Illinois University Carbondale, USA

**SESSION 21
GASIFICATION:
GENERAL – 4**

Shisen Xu and Hong Lu

Research on Two Stage Gasification Reaction Property in a Pulverized Coal Gasifier, Guangyu Li, Shisen Xu, China Huaneng Clean Energy Research Institute, CHINA

Study on Venturi Characteristics in the Dense Phase Pneumatic Conveying System, Kai Liu, Gong Xin, Key Laboratory of Coal Gasification and Energy Chemical Engineering of Ministry of Education, CHINA

Modeling Based Development of Internally Circulating Gasifier for High Ash Coals, Alexander Laugwitz, Bernd Meyer, Institute of Energy Process Engineering and Chemical Engineering – Technical University

Bergakademie Freiberg; Martin Gräbner, Air Liquide Forschung und Entwicklung GmbH, GERMANY

Computational Fluid Dynamics Modeling for Coal Size Effect on Coal Gasification in a Two-stage Commercial Entrained-Bed Gasifier, Hyo Jae Jeong, Jungho Hwang, Yonsei University; Dong Kyun Seo, KEPCO Research Institute, KOREA

A Dynamic Modeling and Simulation of an Entrained Flow Coal Gasifier, Zelin Wu, Ryang-Gyoon Kim, Chung-Hwan Jeon, Pusan National University, KOREA

**SESSION 22
CLEAN COAL AND GAS TO FUELS:
GENERAL - 4**

Qiwen Sun and Shouli Sun

High Purity Hydrogen from Coal in a Novel Reactant Looping Gasification, Tomasz Wiltowski, Kanchan Mondal, Southern Illinois University, USA

Hydrogenation of Coal Tar on Dinickel Phosphide Supported on Alumina Catalyst, Shibiao Ren, Xianzhong Cao, Zhiping Lei, Zhicai Wang, Hengfu Shui, Shigang Kang, Chunxiu Pan, Anhui University of Technology, CHINA

Fischer Tropsch Synthesis in Supercritical CO₂ Atmosphere with Product Gas Recycle, Kanchan Mondal, Adam Sim, Madhav Soti, David Carron, Tomasz Wiltowski, Southern Illinois University, USA

**SESSION 23
CARBON MANAGEMENT:
GENERAL - 1**

Steve Carpenter and Yinhua Long

CO₂ Capture RD&D Proceedings in China Huaneng Group, Shisen Xu, Huaneng Clean Energy Research Institute, CHINA

Dynamic Simulation of MEA-Based Post-Combustion Carbon Capture System, Yali Xue, He Xin, Xu Zhaofeng, Li Zheng, Tsinghua University, CHINA

Dynamic Modeling and Control of Post-Combustion CO₂ Capture Process Integrated with Supercritical Pulverized Coal Plant, Qiang Zhang, Debansu Bhattacharyya, Richard Turton, West Virginia University, USA

Aqueous Ammonia and Amino Acid Salts Blends for CO₂ Capture, Hai Yu, Leigh Wardhaugh, Paul Feron, CSIRO Energy Technology; Qi Yang, CSIRO Materials Science and Engineering; Kangkang Li, Moses Tade, Curtin University of Technology, AUSTRALIA; Nan Yang, Dongyao Xu, China University of Mining and Technology (Beijing); Jingwen Yu, Shujuan Wang, Tsinghua University, CHINA

Investigation of Carbon Dioxide Desorption in Membrane Vacuum Regeneration Process, Mengxiang Fang, Zhen Wang, Qinhu Ma, Zhongyang Luo, Zhejiang University; Shuiping Yan, Huazhong Agricultural University, CHINA

**SESSION 24
COMBUSTION:
COMBUSTION STUDIES**

Li Weng and Zhongyang Luo

Mild Combustion of a Lignite Coal in a Laboratory Scale Furnace, Pedro Nel Alvarado, Universidad de Antioquia, COLOMBIA; Bassam Dally, Manabendra Saha, Paul Medwell, The University of Adelaide, AUSTRALIA

Estimation of Combustion Reactivity of Different Coal Rank Chars by Physicochemical Properties, Xuliang Jing, Zhiqing Wang, Yitian Fang, Institute of Coal Chemistry, Chinese Academy of Sciences, CHINA

Providing Explosion Safety in Intermediate Dustbin Systems when Burning Coals with High Volatile Content, Krzysztof Jesionek, Wrocław University of Technology, POLAND; Iliya Iliev, Ruse University, TOTEMA – Engineering Ltd., BULGARIA

Assessment of the Spontaneous Combustion Potential of Coal Using the Pulse Flow Calorimetric Method: A 20-year Experience, Boleslav Taraba, University of Ostrava, CZECH REPUBLIC

**SESSION 25
COAL SCIENCE:
GENERAL – 5**

Zhenyu Liu and Yinhua Long

Behaviors of Radical Fragments in Tar Generated from Pyrolysis of Coal under Various Conditions, Wenjing He, Qingya Liu, Zhenyu Liu, Lei Shi, Muxin Liu, Beijing University of Chemical Technology; Xiaofen Guo, Caroline Lievens, Donghui Ci, NICE, CHINA

Preparation of Char-Water Slurry Using Various Coal Chars Derived from Pyrolysis and Hydrothermal Treatment, Jianmin Fu, Yutao Shen, Jie Wang, East China University of Science and Technology, CHINA

Separation of Phenol from Oils with Quaternary Ammonium Salts via Forming Deep Eutectic Solvents, Weize Wu, Wujie Guo, Ying Xiao, Zhongyi Li, Beijing University of Chemical Technology; Yucui Hou, Taiyuan Normal University, CHINA

**SESSION 26
COAL MINING:
SAFETY, ECONOMICS AND MINING
TECHNOLOGY**

Bruce Sass and Yann Bush

Field Performance of an SIUC Innovative Spray System for Continuous Miners for Coal Mine Dust Control, Yoginder P. Chugh, Harrold Gurley, Vijaya K. Kollipara, Southern Illinois University Carbondale, USA

Development of China's Coal Mining Technology and Equipment, Wang Guo-fa, China Coal Research Institute, CHINA

Top Coal Caving Method for Middle Hard Thick Coal Seam in Shendong Coal Field, Haiyong Yu, Tiandi Science & Technology Co., Ltd, CHINA

Meso-Fracture Experimental Method of Coal Containing Gas Based on the Industrial Computerized Tomography, Baisheng Nie, Xiangchun Li, Junqing Meng, Hui Zhang, China University of Mining & Technology(Beijing), CHINA

**SESSION 27
GASIFICATION:
GENERAL – 5**

Shisen Xu and Hong Lu

Simulation of a Catalytic Coal Gasification in Elevated Jetting Fluidized Bed, Weiwei Li, University of Chinese Academy of Sciences; Kezhong Li, Rong Zhang, Jicheng Bi, Chinese Academy of Sciences; Shouguo Kang, Jingru Zu, State Key Laboratory of Coal-based Low carbon Energy, ENN Group Co., Ltd, CHINA

Advanced High Pressure Multipiston Feeder for Coal and Coal-Biomass Mixtures, Santosh Gangwal, Tim

Hansen, Southern Research Institute, USA; Thomas Koch, Peter Friebling, TK Energy ApS, DENMARK

Industrial Scale Fixed Bed Biomass Gasification Experiment, Johan C. van Dyk, Sasol Technology, SOUTH AFRICA; Kamil Kwiatkowski, University of Warsaw; Marek Dudynski, Karol Bajer, Modern Technologies and Filtration, POLAND

Experimental and Kinetics Studies on Co-Gasification of German Brown Coal and Wheat Straw, Lingmei Zhou, Martin Schurz, Denise Reichel, Guanjun Zhang, TU Bergakademie Freiberg, GERMANY

**SESSION 28
CLEAN COAL AND GAS TO FUELS:
GENERAL – 5**

Sam Tam and Xiaofen Guo

Gasoline from Coal and/or Biomass with CO₂ Capture and Storage, Guangjian Liu, North China Electric Power University; Xiangbo Guo, Research Institute of Petroleum Processing, SINOPEC, CHINA; Eric D. Larson, Robert H. Williams, Princeton University, USA

STF Technology – Production of High Octane Gasoline from Synthesis Gas on a New Route, Mario Kuschel, Joachim Engelmann, Chemieanlagenbau Chemnitz GmbH; Bernd Meyer, TU Bergakademie Freiberg, GERMANY

Study of Direct Conversion of Syngas to Light Olefins Over Fe Based Carbon Sphere Catalysts, Rui Wang, Xiaofen Guo, Qi Sun, National Institute of Clean-and-Low-Carbon Energy, CHINA

PDU Scale Demonstration of Substitute Natural Gas Production Using Steam Hydrogasification, Chan Seung Park, Yoothana Thanmongkhon, Joseph Norbeck, University of California, Riverside, USA

**SESSION 29
CARBON MANAGEMENT:
GENERAL – 2**

Steve Carpenter and Wenying Li

Alternative to Sequestration – Converting CO₂ into Synthetic Gas, David Banitt, Julie Horn, NewCO2Fuels, ISRAEL

Carbon Dioxide Utilization by Catalytic Reactions, Zinifer Rishatovich Ismagilov, Institute of Coal Chemistry and Material Science SB RAS; Svetlana Valerievna Lazareva, Nadezhda Vasl'evna Shikina, Borekov Institute of Catalysis SB RAS; Tatiana Nikolaevna Teryaeva, Kuzbass State Technical University, RUSSIA

Towards Industrialization of CO₂ Reforming CH₄ to Syngas Over the Carbonaceous Catalyst, Yongfa Zhang, Guojie Zhang, Yiannian Du, Taiyuan University of Technology, CHINA

Capturing of CO₂ with Tetraethylenepentamine-Impregnated Industrial Grade Multi-Walled Carbon Nanotubes, Qing Liu, Shudong Zheng, Mengna Tao, Yi He, Yao Shi, Zhejiang University, CHINA

**SESSION 30
COMBUSTION:
MODELLING STUDIES**

Li Weng and Zhongyang Luo

Numerical Modeling and Simulation of Hydrogen Sulphide Behavior in Pulverized Coal Combustion, Kenji Tanno, Hiroaki Watanabe, Hirofumi Tsuji, Satoshi Umemoto, Hiroki Umetsu, Hiromi Shirai, Central Research Institute of Electric Power Industry, JAPAN

Numerical Investigation of Chemical Reactions Inside Char Particle Macropores, Andreas Richter, Petr A. Nikrityuk, TU Bergakademie Freiberg, VIRTUHCON, GERMANY

The Influence of Shape on the Carbon Consumption of Non-Spherical, Reacting Carbon Particles, Matthias Kestel, Petr Nikrityuk, VIRTUHCON TU-Bergakademie Freiberg; Andreas Richter, Bernd Meyer, TU-Bergakademie Freiberg, GERMANY

3D Numerical Simulation of Gas-Solid Hydrodynamics and Coal Combustion in an Industrial Scale Circulating Fluidized Bed, Massoud Massoudi Farid, Yonsei University; Hyo Jae Jeong, Junggho Hwang, Yonsei University; Yonsei University; Jong-Min Lee, Dong-Won Kim, Korea Electric Power Corporation (KEPCO) Research Institute, KOREA

**SESSION 31
COAL SCIENCE:
GENERAL – 6**

Zhenyu Liu and Yajun Tian

Experimental Study on Emission of Arsenic during High Arsenic Coal Combustion Process, Bengen Gong, Junying Zhang, Yongchun Zhao, Chuguang Zheng, Huazhong University of Science & Technology, CHINA

Performance and Flow Pattern of Cyclone in Parallel with Tangential-inlet, Feng Liu, Jianyi Chen, China University of Petroleum, CHINA

Study Coal Thermal Kinetics Using In-Situ Pyrolytic Time of Flight Mass Spectrometer, Lei Shi, Zichao Tang, Xinglong Wang, Gang Li, Dalian Institute of Chemical Physics, Chinese Academy of Sciences, CHINA

**SESSION 32
SUSTAINABILITY AND ENVIRONMENT:
GENERAL – 1**

Qiang Yao and Xinze Lan

The High Efficiency and Near Zero Emission Technologies Based on Coal Utilization, Minfang Han, Suping Peng, China University of Mining and Technology, CHINA

Solubilisation of Victorian Brown Coal in 'Distillable' DIMCARB, Ying Qi, Tarun Tikko, Vince Verheyen, Vijay Ranganathan, Douglas MacFarlane, Alan L Chaffee, Monash University, AUSTRALIA

Influence of Thermal Pretreatment and Acid-washing on Lignite Pyrolysis at Low Temperature, Huiling Rong, Cuiping Ye, Xiaohong Li, Jie Feng, Wenying Li, Taiyuan University of Technology; Xiaofen Guo, Ke Liu, NICE, CHINA

**SESSION 33
GASIFICATION:
GENERAL – 6**

Ke Liu and Shisen Xu

Advanced Acid Gas Separation Technology for Gasification Markets, Jeffrey W. Kloosterman, Robert Quinn, Fabrice Amy, Jeffrey R. Hufton, Shubhra Bhadra, Ellen M. O'Connell, Air Products and Chemicals; Grant Dunham, Michael Swanson, Energy and Environmental Research Center, USA

Performance of a Small-Scale Injector for Atomization of Coal-Water and Petcoke-Water Slurries, Travis Waind, Kevin Whitty, Pal Toth, University of Utah, USA

SESSION 34
CLEAN COAL AND GAS TO FUELS:
GENERAL - 6

Qiwen Sun and Shetian Liu

Process Simulation of Synthesizing Tert-Amyl Methyl Ether with Methanol and C5 Alkenes from High-temperature Fisher-Tropsch Syncrude Oil, Wenying Li, Yanli Wu, Qiang Li, Qun Yi, Jie Feng, Taiyuan University of Technology, CHINA

Kinetic Study of Gasoline Synthesis from Coal Based Syngas via Methanol and Dimethyl Ether Using Dual Reactor System, Yizhuo Han, Tao Zhang, Yisheng Tan, State Key Laboratory of Coal Conversion, Institute of Coal Chemistry, Chinese Academy of Sciences, CHINA

Sour Methanation Catalysts and Process Development, Shaodong Qin, Qi Sun, Shouli Sun, Dayong Tian, Donghui Ci, Coal Chemical Catalysis Center, National Institute of Clean-and-Low-Carbon Energy, CHINA

SESSION 35
CARBON MANAGEMENT:
GENERAL - 3

Wenying Li and Mengxiang Fang

New Enterprises and New Vista - Geological Storage of CO₂ Emitted by Coal Chemical Plants in China, Rongshu Zeng, Xingyou Tian, Shu Wang, Wendong Xu, Institute of Geology and Geophysics, Chinese Academy of Sciences (IGGCAS), CHINA; Ceri Jayne Vincent, Mike H Stephenson, British Geological Survey, UNITED KINGDOM

TC-265: Development of the First Internationally Accepted Standard for Geologic Storage of Carbon Dioxide under Organization of International Standardization (ISO), Steven M. Carpenter, Advanced Resources International, Inc., USA

MVA Techniques and Application at the Citronelle SECARB Phase III Site, Alabama, Steven Carpenter, George Koperna, Jr., Advanced Resources International, Inc.; Richard Rhudy, Robert Trautz, EPRI; Richard Esposito, Southern Company; Gerald R. Hill, Southern States Energy Board, USA

From Coal Flue Gas to Fungible Fuels: Demonstration of an Algae Based System for CO₂ Mitigation from Coal Fired Power Plants, Michael Hayes Wilson, Jack Groppo, Andrew J. Placido, Mark Crocker, Eduardo Jimenez, University of Kentucky Center for Applied Energy Research; Aubrey Shea, Czarena Crofcheck, University of Kentucky Biosystems and Agricultural Engineering; Doug Durst, Duke Energy, USA

SESSION 36
COMBUSTION:
NO_x STUDIES

Hong Lu and Zhongyang Luo

Experimental Study on NO Emission during Coal Char Combustion, Jie Xu, Rui Sun, Lijin-Ma, Hui Liu, Harbin Institute of Technology, CHINA

Effects of the Alkali Metals on NO Reduction during Biomass Advanced Reburning, Jiangtao Hao, Ping Lu, Wei Yu, Yufei Zhang, Xiuming Zhu, Nanjing Normal University, CHINA

Influence of Fly Ash & K/Na Additives on the Thermal DeNO_x Process, Wei Yu, Ping Lu, Jiangtao Hao, Yufei Zhang, Xiuming Zhu, Nanjing Normal University, CHINA

A Study on Absorption of NO in an Aqueous Solution of Sodium Persulfate, Xuchun Gao, Xiaoxun Ma, Xue Kang, Ya Shi, Northwest University, CHINA

ORAL SESSIONS
Wednesday, September 18, 2013

SESSION 37
COAL SCIENCE:
GENERAL - 7

Kouichi Miura and Wenhua Li

Properties of Solidified Fly Ash Suspension Heated at High Temperature, Radoslaw Pomykala, POLAND

Critical Evaluation of Mineral Contents in Coal Using Chemical Quantitative Phase Analysis Method, Z. Klika, I. Kolomaznik, VŠB-Technical University Ostrava, CZECH REPUBLIC

Experimental Investigation of Factors Governing the Fragmentation of Coal Particles at High-Temperature Pyrolysis, Felix Baitalow, Shan Zhong, Petr Nikrityuk, Heiner Gutte, Bernd Meyer, TU Bergakademie Freiberg, GERMANY

SESSION 38
SUSTAINABILITY AND ENVIRONMENT:
GENERAL - 2

Qiang Yao and Li Weng

Physical-Chemical Characteristics and Potential Utilization of Ferrosphere in Hg Oxidation, Jianping Yang, Yongchun Zhao, Junying Zhang, Chuguang Zheng, Huazhong University of Science and Technology, CHINA

Study on Photocatalytic Conversion of CO₂ into Hydrocarbon Fuels over Cerium Doped Titania Nanoparticles, Zhuo Xiong, Yongchun Zhao, Junying Zhang, Chuguang Zheng, Huazhong University of Science & Technology, CHINA

Smart Power Management System for Coal Mining Industry, George Zhou, Francis Wang, Jim Hu, Simon Xue, National Institute of Clean-and-Low-Carbon Energy, CHINA

A Comparison of the Effects of Coal Production in West Virginia and Shanxi, Qingyun Sun, Jerald Fletcher, Nyakundi Michieka, US-China Energy Center at West Virginia University, USA

Trace Element Geochemistry of Some Chinese Coals, Lu Xukun, Tang Yuegang, Hou Xianxu, Guo Xin, China University of Mining and Technology; Zheng Baoshan, Chinese Academy of Sciences, CHINA; Robert B. Finkelman, University of Texas at Dallas; Harvey E. Belkin, US Geological Survey, USA

SESSION 39
GASIFICATION:
GENERAL - 7

Fuchen Wang and Johan Van Dyk

Synergies in Co-Pyrolysis of Lignite and Coal Liquefaction Residues, Xu Bang, Chu Mo, Cao Wenhan, Chang Zhibing, China University of Mining and Technology (Beijing); Sun Renhui, NICE, CHINA

Molding a Three-Dimensional Hybrid Entrained-Flow and Fluidized-Bed Mild Coal Gasifier, Ting Wang, You Lu, University of New Orleans, USA

Development of a Higher Concentration Slurry Process Using Low-Rank Coals for the GE Entrained-flow Gasification System, Raul Ayala, Judith Oppenheim, Larry Duke, GE Power & Water, USA; Xijing Bi, GE Global Research - China, CHINA

SESSION 40
CLEAN COAL AND GAS TO FUELS:
GENERAL - 7

Ke Liu and Xiaofen Guo

Fast Co-pyrolysis of Coal and Biomass in a Fluidized-Bed Reactor, Jianfei Wang, Jiantao Zhao, Jiejie Huang, Shuangshuang Song, Songping Gao, Yitang Fang, Chinese Academy of Sciences, CHINA

Ni/Mg-Al Oxide Catalysts for Low-Temperature CO₂ Reforming with CH₄: Effect of Preparation Method on Catalytic Performances, Jie Feng, Xiangdong Feng, Jieying Jing, Xiaohong Li, Wenying Li, Taiyuan University of Technology, CHINA

Structure and Hydrogen Storage Properties of the Mg-C Composites Prepared by Mechanical Milling and Heat Treatment, Tonghuan Zhang, Shixue Zhou, Naifei Wang, Weixian Ran, Haipeng Chen, Qianqian Zhang, Shandong University of Science and Technology, CHINA

Solid-State Synthesis of Calcium Carbide, Patrick E. Iyere, Edward M. Sabolsky, Ismail B. Celik, Katarzyna Sabolsky, Steven L. Rowan, West Virginia University; Stan Morrow, Hadron Technologies Inc, USA; Matt Targett, LP Amina, CHINA

SESSION 41
CARBON MANAGEMENT:
GENERAL - 4

Menxiang Fang and Wenying Li

Synthesis of Solid Amine Sorbents from Fly Ash for CO₂ Capture, Zhang Zhonghua, Wang Baodong, Sun Qi, National Institute of Clean-and-Low-Carbon Energy, CHINA

Effect of NaNO₃ on the CO₂ Capture Activity of MgO-CaCO₃-NaNO₃ Sorbent, Xinfang Yang, Lifeng Zhao, Yunhan Xiao, Chinese Academy of Sciences, CHINA

The Effect of Doping CeO₂ for CO₂ Capture of Calcium-Based Sorbent at High Temperature, Xiaotong Liu, Xiaoxun Ma, Junfei Shi, Northwest University; Shisen Xu, Chen Li, China Huaneng Group Clean Energy Technology Research Institute Co., Ltd, CHINA

Theoretical Screening of Solid Sorbents for CO₂ Capture Applications, Lifeng Zhao, Yunhan Xiao, Chinese Academy of Sciences, CHINA; Yuhua Duan, DOE/NETL; Keling Zhang, Xiaohong Shari Li, David King, Pacific Northwest National Laboratory, USA

SESSION 42
COMBUSTION:
ASH AND MERCURY

Baodong Wang and Shaozeng Sun

A Study of Slagging and Fouling: Current Theory and Experimental Characterisation of Deposits, Anthony De Girolamo, Bai Qian Dai, Lian Zhang, Monash University, AUSTRALIA; Xiaojiang Wu, Shanghai Boiler Works Co Ltd, CHINA

Numerical Study on Ash Deposition of Blending Coal in a Drop Tube Furnace, Chung-Hwan Jeon, Byung-hwa Lee, Min-Young Hwang, Seoung-Mo Kim, Sang-In Kim, Ke-Ju An, Pusan Clean Coal Center, Pusan National University, KOREA

Fine Particulate Matter Formation during Co-Firing Lignite with Semi-Char in 25KW Down Fired Furnace, Gengda Li, Shuiqing Li, Qian Huang, Qiang Yao, Tsinghua University; Zhangfa Wu, Cliff Y. Guo, National Institute of Clean-and-Low-Carbon Energy, CHINA

**SESSION 43
COAL SCIENCE:
GENERAL - 8**

Zhenyu Liu and Xiaoyi Gong

Analysis of Low Temperature Oxidation of Coal to Understand the Self-Ignition Mechanism of Coal, Kouichi Miura, Hiroyasu Fujitsuka, Ryuichi Ashida, Kyoto University, JAPAN

Controlled Separation of $\geq 300^\circ\text{C}$ Fractions from Low Temperature Coal Tar Based On Selective Reactions, Ming Sun, Xiaoxun Ma, Pengpeng Du, Jing Chen, Northwest University, CHINA

Investigation of Drying Kinetics of Lignites under Isothermal Condition, Sun Xiaolin, Gong Xin, Guo Xiaolei, East China University of Science and Technology, CHINA

**SESSION 44
SUSTAINABILITY AND ENVIRONMENT:
GENERAL - 3**

Baodong Wang and Xiaoxun Ma

Optimal CO₂ Abatement Pathways with Induced Technological Progress for Chinese Coal-Fired Power Industry, Aijun Li, Huazhong University of Science & Technology; Zheng Li, Tsinghua University, CHINA

Forecasting Future Coal Production from Surface Mining in Central Appalachia, J. Wesley Burnett, Michael Strager, Jacquelyn Strager, Aaron E. Maxwell, West Virginia University; Brad Kreps, The Nature Conservancy, USA

**SESSION 45
GASIFICATION:
GENERAL - 8**

Fuchen Wang and Johan Van Dyk

Three Dimensional Computational Fluid Dynamics Simulation for Parametric Study on Gasification Performance in an One-stage Entrained Bed Gasifier, Sang Shin Park, Hyo Jae Jeong, Jungho Hwang, Yonsei University, KOREA

A TG-FTIR Study of Low Rank Coals, Donghui Ci, Caroline Lievens, Xiaofen Guo, NICE, CHINA

Synergistic Effects during Fast Co-Pyrolysis of Corn-cob-Lignite Blends Effect on Char Oxidation Reactivity, Meijun Wang, Chunhui Fu, Liping Chang, Taiyuan University of Technology, CHINA; Daniel Roberts, CSIRO, AUSTRALIA

Effects of Inherent Moisture Contents on Lignite Conversion in the Absence and Presence of Steam as Reaction Atmosphere, Lei Bai, Kunjun Zhang, Shu Zhang, Yonggang Wang, Kai Xu, China University of Mining and Technology (Beijing), CHINA

**SESSION 46
CLEAN COAL AND GAS TO FUELS:
GENERAL - 8**

Shouli Sun and Zhuowu Men

Electrochemical Capture of CO₂ and Instant Conversion into Syngas, Kevin Huang, Lingling Zhang, University of

South Carolina, USA; Zhibin Yang, Minfang Han, China University of Mining and Technology, CHINA

Crack Formation Characteristic of "Ball Structure" Carbonized Briquette, Yuqiong Zhao, Yongfa Zhang, Yan Liang, Yuliang Shi, Weiqing Chen, Taiyuan University of Technology, CHINA

Role of the Ti, Mn, and Cu Promoters on the Structure, Reduction, and Catalytic Behavior of Iron-Based Fischer-Tropsch Catalysts, Wang Peng, Shi Yulin, Wang Li, Lv Yijun, Wu Peng, Cheng Meng, National Institute of Clean-and-Low-Carbon Energy, CHINA

Study on Shrinkage Characteristic of Briquette during the Pyrolysis Process, Qi Wang, Yongfa Zhang, Yuqiong Zhao, Taiyuan University of Technology, CHINA

**SESSION 47
GASIFICATION:
GENERAL - 10**

Shisen Xu and Yi Guo

Co-Pyrolysis Behavior of Saw Dust, Straw and Shenfu Bituminous Coal in Fixed Bed Reactor, Shuaidan Li, Guangsu Yu, Xueli Chen, Li Wang, Key Laboratory of Coal Gasification and Energy Chemical Engineering of Ministry of Education, CHINA

Effect of Mineral Content and Composition on Catalytic Coal Gasification Characteristics, Tao Lu, University of Chinese Academy of Sciences; Kezhong Li, Rong Zhang, Jicheng Bi, Chinese Academy of Sciences, CHINA

Characteristics of Soot Formed by Rapid Pyrolysis of Solid Carbonaceous Materials, Zhike Gai, University of Chinese Academy of Sciences; Rong Zhang, Jicheng Bi, Chinese Academy of Sciences, CHINA

Effect of Temperature and Pressure on Brown Coal Pyrolysis in a Drop Tube Reactor, Stephan Siegl, Denise Reichel, Steffen Krzack, Bernd Meyer, TU Bergakademie Freiberg, GERMANY

Influence of the Hydrothermal Dewatering on the Physicochemical Characteristics of Chinese Low-Rank Coals, Lichao Ge, Yanwei Zhang, Zhihua Wang, Junhu Zhou, Kefa Cen, Zhejiang University, CHINA

**SESSION 48
COMBUSTION:
OXY-COMBUSTION & CHEMICAL LOOPING - 1**

Zhangfa Wu and Shaozeng Sun

Update of Alstom's Oxy-Combustion Development for Steam Power Plants, James R. Kenney, Armand A. Levasseur, Carl D. Edberg, Alstom Power Inc., USA; Benedicte Prodhomme, Alstom Power Systems SA, FRANCE

Ignition and Combustion Characteristics of Wet Victorian Brown Coal in Oxy-Firing and Air-Firing Conditions, Wirhan Pratiomo, Lian Zhang, Jian Zhang, Monash University, AUSTRALIA

Chemical Looping Combustion of Methane over Bimetallic Fe₂O₃ - CUO Oxides with Higher Amounts of Fe Oxide, Ewelina Ksepko, Marek Sciazko, Institute for Chemical Processing of Coal, POLAND; Ranjani V. Siriwardane, DOE/NETL; Hanjing Tian, Thomas Simonyi, URS-Energy & Construction, DOE/NETL, USA

Development, Scale-Up and Process Modeling of Copper-Based Chemical Looping with Oxygen Uncoupling (CLOU), Kevin Whitty, JoAnn Lighty, The University of Utah, USA

Pore Structures Change of Different Particle Size of Pulverized Coal Combustion in an O₂/CO₂ Atmosphere,

Baojun Yi, Liqi Zhang, Zihui Mao, Fang Huang, Chuguang Zheng, Huazhong University of Science and Technology, CHINA

Combustion of Carbonaceous Material in High Temperature of the Oxidizer with Low Oxygen Concentration, Pedro Nel Alvarado, Wilson Ruiz, Francisco Cadavid, Andrés Amell, Universidad de Antioquia, COLOMBIA

**SESSION 49
COAL SCIENCE:
GENERAL - 9**

Zhenyu Liu and Yajun Tian

An Integrated Process of Coal Pyrolysis with Methane Steam Reforming for Improving Tar Yield, Haoquan Hu, Chan Dong, Lijun Jin, Peng Zheng, Yang Li, Dalian University of Technology, CHINA

Catalytic Performance of Chars as Catalyst for Reforming Pyrolytic Tars from Shengli Lignite Pyrolysis, Fangjie Wang, Yonggang Wang, Zongding Chen, Shu Zhang, Shou-Yi Li, China University of Mining and Technology (Beijing), CHINA

Studies on Physical and Chemical Properties of Liquid Products in the Extraction of Coals with Supercritical Carbon Dioxide/NMP Mixed Solvent, Ye Sun, Xingjun Wang, Zhenghua Dai, Guangsu Yu, Fuchen Wang, Key Laboratory of Coal Gasification and Energy Chemical Engineering of Ministry of Education, CHINA

Effects of Pyrolysis Conditions on Swelling and Sphericity Properties of Chinese Coals, Wen Yuxin, Xu Xiang, Yang Shaojun, Xiao Yunhan, Chinese Academy of Sciences, CHINA

Catalyst Development for Rate Enhanced Acid Gas (CO₂) Scrubbing, Kunlei Liu, Cameron Lippert, Joe Remias, University of Kentucky, Center for Applied Energy Research, USA

**SESSION 50
SUSTAINABILITY AND ENVIRONMENT:
GENERAL - 4**

Xiaoxun Ma and Yonglong Li

Effect of O₂ Content during Calcination of V₂O₅-WO₃/TiO₂ Catalyst on Selective Catalytic Reduction Activity of NO by NH₃, Qingya Liu, Xiaomin Hou, Zhenyu Liu, Guojun Yin, Sifan Chen, Beijing University of Chemical Technology, CHINA

Characterization of Sulfation Behavior of Indian Limestones for Sulfur Capture, Sarma V. Pisupati, Hari S. Jammulamadaka, The Pennsylvania State University, USA

**SESSION 51
GASIFICATION:
GENERAL - 9**

Fuchen Wang and Johan Van Dyk

Downdraft Steam-Plasma Gasification of Coal: 1D Kinetic Model and Results, Vadim A. Kuznetsov, Institute for Electrophysics and Electric Power RAS, RUSSIA

Preliminary Characteristic of Coal Gasification by-product from Pilot Plants Based on Fluidized Bed Reactors, Radoslaw Pomykala, AGH University of Science and Technology, POLAND

Common Active Sites Assumption of Coal Char Gasification in the Mixture of H₂O and CO₂, Rui Zhang, Qinhui Wang, Zhongyang Luo, Mengxiang Fang, Zhejiang University, CHINA

Study on Solutions to Resistance to Slagging of the Easy Slagging Wangjiata Type Coal, Yandong Mao, Jicheng Bi, Yan Zheng, Huifang Wang, Yadan Jin, ENN Group Co., Ltd.; Feng Xin, Tianjin University, CHINA

Sulfide Capturing Techniques for Advanced Fuel Conversion Process by Silica-Supported Sorbents, Yau-Pin Chyou, Liang-Wei Huang, Institute of Nuclear Energy Research, TAIWAN

**SESSION 52
CLEAN COAL AND GAS TO FUELS:
GENERAL - 9**

Changkun Liu and Ke Liu

Experiments Study on Coal Tar Pyrolysis in Thermal Plasma, Li Xuan, Han Jiantao, Cliff Yi Guo, National Institute of Clean-and-low-carbon Energy; Yan Binhang, Cheng Yan, Cheng Yi, Tsinghua University, CHINA

The Effect of Coal Pyrolysis Temperature on the Gas Evolution, Mengxiang Fang, Chao Li, Leming Cheng, Jun Li, Min Li, Zhongyang Luo, Zhejiang University, CHINA

The Catalytic Effect of CaO and Fe₂O₃ on Reducing PAHs Release During Coal Pyrolysis, Chun Zhang, Guanglong Li, Lunjing Yan, Changlong Liu, Fan Li, Taiyuan University of Technology, CHINA

CO₂ Reforming of CH₄ over Ni Catalyst Prepared from MgAl Layered Double Hydroxide by Two-Steps Method, Haoquan Hu, Mingguang Song, Lijun Jin, Chan Dong, Dalian University of Technology, CHINA

Sulfur Removal and Release Behaviors of Sulfur-Containing Model Compounds during Pyrolysis Under Inert Atmosphere, Fenrong Liu, Lili Xie, Mei Xue, Ruisheng Hu, Huiqing Guo, Inner Mongolia University; Haoquan Hu, Dalian University of Technology, CHINA

**SESSION 53
GASIFICATION:
GENERAL - 11**

Shisen Xu and Yi Guo

Synergies in Co-Gasification with Mixtures of H₂O and CO₂, Yonghui Bai, Lunjing Yan, Changlong Liu, Yulong Wang, Fan Li, Taiyuan University of Technology, CHINA

Computational Fluid Dynamics Simulation of Coal Gasification in a Circulating Fluidized Bed Gasifier, Yawen Zhang, University of Chinese Academy of Sciences; Fulin Lei, Yunhan Xiao, Chinese Academy of Sciences, CHINA

Mineral Matter Behavior during Co-Gasification of Coal and Biomass, Guanjun Zhang, Mathias Klinger, Marcus Schreiner, Deutsches EnergieRohstoff-Zentrum; Bernd Meyer, TU Freiberg, GERMANY

Syngas Combustion in Ash Layer Remained on Coal Surface during Gasification, Xi Lin, Zhenyu Liu, Qingya Liu, Beijing University of Chemical Technology, CHINA

Sintering Characteristics of Fly Ash from Lignite Gasification in Fluidized Bed, Xin Yang, Jiejie Huang, Huibin Fang, Yitian Fang, Yang Wang, Junguo Li, Chinese Academy of Sciences, CHINA

The Effect of Cooling Rates on Crystallization Characteristics of Coal Slag, Xuan Weiwei, Zhang Jiansheng, Tsinghua University, CHINA

**SESSION 54
COMBUSTION:
OXY-COMBUSTION & CHEMICAL LOOPING - 2**

Shaoyang Sun and Xianglong Zhao

Devolatilization of US and Chinese Coals Under Oxy-Combustion Conditions, Xiaohong Huang, Zhao-Hui Liu, Chu-Guang Zheng, Huazhong University of Science and Technology, CHINA; Shengteng Hu, Babcock & Wilcox Research Center, USA

Char Burnout of U.S. and Chinese Coals Under Oxy-Combustion Conditions, Shengteng Hu, Babcock & Wilcox Research Center; Alan N. Sayre, Babcock & Wilcox Power Generation Group, Inc., USA; Xiaohong Huang, Zhao-Hui Liu, Huazhong University of Science and Technology, CHINA

Redox Kinetics of Oxygen Carriers for Chemical Looping, Marek Sciazko, Ewelina Ksepko, Institute for Chemical Processing of Coal, POLAND

Effects of Steam on Coal Pyrolysis and Char Combustion in the Presence of CO₂, Dunxi Yu, Wenyu Sun, Minghou Xu, Huazhong University of Science and Technology, CHINA

Experimental and Modelling Investigation of the Pilot-Scale Oxy-Fuel Combustion of Victorian Brown Coal, Lian Zhang, Jian Zhang, Xiaojiang Wu, Monash University, AUSTRALIA; Jianwen Zhang, Shanghai Boiler Works Co Ltd, CHINA; Yoshihiko Ninomiya, Chubu University, JAPAN

Flameless Pressurized Oxy-Coal: The Top of Power Cost Competition for CCS, and the Best Cost Option Along the Transition to Near-Zero Emission, Massimo P. Malavasi, SVP R&D, ITEA Spa; Giancarlo Benelli, Nicola Rossi, Danila Cumbo, Alessio Bardi, ENEL Ingegneria e Ricerca, ITALY

**POSTER SESSIONS
Monday, September 16, 2013**

**POSTER SESSION 1
GASIFICATION**

Characteristics of Solid Materials Sampled at Several Points during Operation of the 3T/d Entrained Coal Gasifier, Bongjin Jung, Nayeon Lee, Chan Lee, The University of Suwon; Yongseung Yoon, Institute for Advanced Engineering; Daesung Kim, Korea Westernpower Co., KOREA

Comparison of Ash Fusibility Behavior in Thermal System using Coal and Solid Waste Fuels, Nayeon Lee, Bongjin Jung, The University of Suwon; Soo-tae Choo, Samsung-BP Chemicals Co., Ltd, KOREA

The Effect of Flux on Ash Fusibility of High-Calcium Shanxin Coal, Jie Xu, Guangsu Yu, Feng Zhao, Xia Liu, Qinghua Guo, Fuchen Wang, East China University of Science and Technology, CHINA

Comparison of Fouling and Sintering Characteristics of Coal Ash with Several Fouling Factors at Reduction Environment, Hueon Namkung, Dong-ha Jang, Tae-Jin Kang, Dong-Ju Kim, Hyung-Taek Kim, Ajou University, SOUTH KOREA

Kinetic Model of Coal-Char Gasification with Steam at Elevated Pressure, Qixuan Yan, Jiejie Huang, Yitian Fang, Jiantao Zhao, Chinese Academy of Sciences, CHINA

Mild Pyrolysis Behavior and Kinetics Study of Low Rank Coal, Lijuan Gao, Xianglong Zhao, Zhuowu Men, Yi Guo, Ke Liu, NICE, CHINA

Co-Gasification of Coal-Biomass Blended Char with CO₂ at Temperatures of 900-1100°C, Hyo Jae Jeong, Sang Shin Park, Jungho Hwang, Yonsei University, KOREA

A Numerical Study on Coal-Biomass Co-Gasification According to Steam/Fuel Ratio, Jung-Hoon Lee, Hyo Jae Jeong, Sang Shin Park, Jungho Hwang, Yonsei University, KOREA

Co-Gasification of Petcoke with Coal at High Temperatures, Liwei Ren, Jianli Yang, Chinese Academy of Sciences; Feng Gao, Taiyuan University of Technology, CHINA

The Brin Process for Separation of Oxygen from Air, Evan Granite, Elliot Roth, Michael Hajduk, Karen Uffalussy, DOE/NETL, USA

The Co-Pyrolysis of Sawdust and Bituminous Coal Using Thermogravimetric Analysis (TGA) and Concentration Measurements of the Evolved Species, Dong Kyun Seo, KEPSCO Research Institute; Sang Shin Park, Jungho Hwang, Hyo-Jae Jung, Yonsei University, KOREA

Overview of Oxygen Generator Materials, Evan Granite, Elliot Roth, Michael Hajduk, Karen Uffalussy, DOE/NETL, USA

Biomimetic Separation of Oxygen from Air, Evan Granite, Elliot Roth, Michael Hajduk, Karen Uffalussy, DOE/NETL, USA

Magnetic Separation of Oxygen from Air, Evan Granite, Elliot Roth, Michael Hajduk, Karen Uffalussy, DOE/NETL, USA

Simulation of High Ash Content Coal Gasification on Circulating Fluidized Bed to Produce Fuel Gas for Ceramic Kilns, Daniel Augusto Kesterling, Thiago Fernandes de Aquino, Beneficent Association of the Santa Catarina Coal Industry - SATC, BRAZIL; Ronald W. Breault, DOE/NETL, USA

Reactivity of Brazilian Coals in CO₂ Atmosphere, Thiago Fernandes de Aquino, Daniel Augusto Kesterling, Giovana Dalpont, Luciane Garavaglia, Beneficent Association of the Santa Catarina Coal Industry - SATC, BRAZIL

Cold Flow Test of Coal Pyrolysis with a Solid Heat Carrier, Shuxian Liu, Xianglong Zhao, Zhuowu Men, Li Weng, Ke Liu, NICE; Minshu Zhan, Guogang Sun, China University of Petroleum-Beijing, CHINA

Gasification Reactivities of Chars Derived from Different Lignites, Jia Tang, Xuantaowu, Jie Wang, East China University of Science and Technology, CHINA

**POSTER SESSION 2
COMBUSTION**

Status and Evaluation of the Various Methods of Renewable Fuel Co-Firing in Korean Pulverized Coal Power Plants, Won Yang, Taehyun Kim, Taeyoung Chae, Korea Institute of Industrial Technology, SOUTH KOREA

Numerical Approaches to Retrofit of a Conventional Pulverized Coal Burner to an Oxy-Firing Burner, Taeyoung Chae, Won Yang, Korea Institute of Industrial Technology; Changkook Ryu, Sungkyunkwan University, SOUTH KOREA

A Study on NO_x Reduction Characteristics through Syngas Reburning in a Pilot Scale Pulverized Coal Combustion System, Seuk Cheun Choi, Taeyoung Chae, Jae Wook Lee, Kie Seop Kang, Won Yang, Korea Institute of Industrial Technology, SOUTH KOREA

An Experimental Study on Slagging/Fouling Characteristics for Various Coals Using a 50kWth Pulverized Coal Combustion System, Jae Wook Lee, Kie-seop Kang, Taeyoung Chae, Ik Hwan Na, Won Yang, Energy System R&D, Korea Institute of Industrial Technology; Changkook Ryu, Sungkyunkwan University, SOUTH KOREA

Development of a Low NO_x Combustor, Sung-Hoon Shim, Sang-Hyun Jeong, Korea Institute of Machinery and Materials; Sang-Sup Lee, Chungbuk National University, KOREA

Numerical Analysis of Fouling Characteristic on the Heavy Fuel Oil Heat Recovery Steam Generator, Chung-Hwan Jeon, Min-Young Hwang, Byung-hwa Lee, Pusan Clean Coal Center, Pusan National University, KOREA

New Method of Characterizing Intrinsic Coal Combustion Behavior with TG, Xin Cui, Yajun Tian, Deting Kong, Haiyun Lu, Aiguo Liu, Cliff Guo, Ke Liu, National Institute of Clean-and-Low-Carbon Energy, CHINA

POSTER SESSION 3 CLEAN COAL AND GAS TO FUELS

Catalytic Hydroprocessing of Model Compounds Simulating Coal Tar, Liangyan Xia, Wei Tang, Mengxiang Fang, Hongyan Wang, Qinhui Wang, Zhongyang Luo, Zhejiang University, CHINA

Cu/SO₂ Catalysts Prepared by Different Methods for Hydrogenation of Ethyl Acetate to Ethanol, Wei Di, Jihong Cheng, Shuxun Tian, Yuan Liu, Shetian Liu, Qi Sun, National Institute of Clean-and-Low carbon Energy, CHINA

Development of Catalyst for Manufacturing High Calorie SNG, Hyongsik Kim, Seongho Hong, Youngsam Oh, KOGAS R&D Center, SOUTH KOREA

Determination of Toluene-Insoluble Content in Coal Pyrolysis Tar and Pitch, Yinhua Long, Shuai Zhao, Xiaofen Guo, National Institute of Clean-and-Low-Carbon Energy, CHINA

Research Progress of Suspended Reactor Hydro-Cracking Technology, Yuanyuan Zhang, China University of Mining and Technology, Beijing, CHINA

Separation of Toluene and Methylcyclohexane by Dimethyl Sulfoxide, Jie Feng, Jianshu Hao, Wenjun Fan, Meixiang Wu, Wenying Li, Cuiping Ye, Taiyuan University of Technology, CHINA

Catalytic Effects of Iron-based Catalysts on Product Distribution of Long-Flame Coal Hydropyrolysis, Wenying Li, Xiaoyong Xue, Yanli Xue, Qun Yi, Xiaohong Li, Jie Feng, Taiyuan University of Technology; Xiaofen Guo, Ke Liu, NICE, CHINA

Recycling of Tail Gas in Fischer-Tropsch Bubble Column Slurry Reactors and its Impact on the Coal-to-Liquid Process, Laurent Sehabiague, Omar Basha, Badie Morsi, University of Pittsburgh, USA

POSTER SESSION 4 SUSTAINABILITY AND ENVIRONMENT

Study on the Optimal Coupling Paths between Nuclear Energy and Coal-Based Synfuels Processes, Jin Li, Nuclear and Radiation Safety Center of the Ministry of Environmental Protection; Chufu Li, Li Weng, National Institute of Clean-and-Low-Carbon Energy, CHINA

Approaches to Developing Methodology for Evaluation of Energy Efficiency of Coal Chemical Processes, Kai-di Sun, Xie Qiang, Jin-chang Liu, China University of Mining & Technology (Beijing), CHINA

POSTER SESSION 5 CARBON MANAGEMENT

The Study on the Carbon Fixation in Berea Sandstone with Different Concentrations of Brine (NaCl/CaCl₂) Solution, Kyoung-Moon Lee, Sang-Phil Yoon, Dong-Ha Jang, Hyung-Taek Kim, Ajou University; Dae-Gee Huh, KIGAM, SOUTH KOREA

Kinetic and Cyclic Performance of the CO₂ Chemisorption on Li₄SiO₄ Doped with Alkaline(K, Al), Xiaoxiang Chen, Yongchun Zhao, Junying Zhang, Chuguang Zheng, Huazhong University of Science & Technology, CHINA

Influence of SO₂ on CO₂ Adsorption on Activated Carbon, Guojun Yin, Qingya Liu, Weize Wu, Zhenyu Liu, Beijing University of Chemical Technology, CHINA

Process Simulation and System Design of the PCC Unit for Coal Fired Power Station, Jinyi Wang, Dongfang Guo, Shiwang Gao, Shisen Xu, Huaneng Clean Energy Research Institute, CHINA

Carbon Dioxide Carbonation of Municipal Solid Waste Incinerator Fly Ash and the Impact on Metal Mobility, Peng Ni, Junying Zhang, Yongchun Zhao, Chuguang Zheng, Huazhong University of Science & Technology, CHINA

Simultaneous Sequestration and Extraction of Geothermal Energy using CO₂ from an IGCC Plant as a Heat Transfer Fluid for Power Generation from EGS, Sarma V. Pisupati, Arun Ram Mohan, Derek Elsworth, The Pennsylvania State University; Uday Turaga, ADI Analytics LLC; Vishakha Shembekar, Omkar Scientific Solutions LLC; Subbaraman Viswanathan, SSTI Inc, USA

Regeneration of CO₂ from CO₂-Rich Mea Solution by Using the Novel Concentration Swing Desorption Technology, Shuiping Yan, Qingyao He, Ping Ai, Huazhong Agricultural University, CHINA

Greenhouse Gas Emission of Coal to Liquids Technologies and Reduction Potential Analysis, Wu Juanni, Tian Yajun, Liu Aiguo, Lu Haiyun, Liu Ke, National Institute of Clean and Low Carbon Energy; Xie Kechang, Chinese Academy of Engineering, CHINA

Assessing the Feasibility of using Ionic Liquids as Physical Solvents for Selective Capture of CO₂ from Fuel Gas Streams, Omar M. Basha, Murphy J. Keller, David R. Luebke, DOE/NETL; Kevin P. Resnik, DOE/NETL and URS Corporation; Badie I. Morsi, University of Pittsburgh and DOE/NETL, USA

Modified Carbon Adsorbents with High Thermal and Oxidative Resistance, Olga S. Efimova, Galina P. Khokhlova, Zinifer R. Ismagilov, Institute of Coal Chemistry and Material Science SB RAS, RUSSIA

POSTER SESSION 6 COAL SCIENCE

Surface Characterization of Ultrafine Fly Ash Interaction with Mercury, Ji-Eun Jung, Jennifer Wilcox, Adam Jew, Erik C. Rupp, Stanford University, USA

The Radiation Characteristics of Radicals in CH₄ Co-Flowing Jet Diffusion Flame, Xudong Song, Guangsu Yu, Qinghua Guo, Ting Zhang, Yan Gong, East China University of Science and Technology, CHINA

The Chemical Structural Characteristics of Coals Rich in Semi-Fusinite, Shaoqing Wang, Yuegang Tang, Fan Huang, Di Jiang, Xukun Lu, Xin He, China University of Mining and Technology (Beijing), CHINA

"Vehicle" Role of Solvent in Direct Coal Liquefaction Process, Muxin Liu, Jianli Yang, Yunmei Li, Yong Yang, Chinese Academy of Sciences; Zhenyu Liu, Wenjing He, Beijing University of Chemical Technology, CHINA

Pyrolysis of Liulin Coal Simulated by GPU-Based ReaxFF MD with Cheminformatics Analysis, Xiaoxia Li, Mo Zheng, Jian Liu, Ze Wang, Xiaoming Gong, Li Guo, Wenli Song, Chinese Academy of Sciences, CHINA

Study of Helianthus Annuus Stem Fast Pyrolysis by Using Py/GC/MS, Huikuan Zhang, Anning Zhou, Fuxin Chen, Xi'an University of Science and Technology, CHINA

The Performance Research of DCFC with Shenfu Semi-Coke as Fuel, Liu Guo-yang, Zhang Ya-ting, Zhou An-ning, Xi'an University of Science and Technology; Qiu Jie-shan, Dalian University of Technology, CHINA

A Preliminary Study on Coal Graphitization in High Temperature, Zhang Xiao-qian, Zhang Ya-ting, Si Yun-peng, Zhou An-ning, Hou Zhi-yong, Xi'an University of Science and Technology, CHINA

Variations in Characteristics of Extract with Coal Rank of Four High-Organic-Sulfur Coals in China, Yuegang Tang, Qiaojing Zhao, Weiwei Li, Liye Wang, Cong Wang, China University of Mining & Technology, CHINA

Coupling of Volatile Radical Fragments in TGA Crucible During Pyrolysis of Coal, Lei Shi, Qingya Liu, Zhenyu Liu, Xiaojin Guo, Wenjing He, Beijing University of Chemical Technology, CHINA

Compare with CO Regeneration and Thermal Regeneration of V₂O₅/AC Catalyst-Sorbent for SO₂ Removal, Yaqin Hou, Rui Zhang, Zhanggen Huang, Shijie Guo, Chinese Academy of Sciences, CHINA

Rapid Oxidation of Lignite to Produce Benzene Carboxylic Acids at High Temperatures, Weize Wu, Wenhua Wang, Muge Niu, Tong Wu, Jian Li, Beijing University of Chemical Technology; Yucui Hou, Taiyuan Normal University, CHINA

Catalytic Oxidation of Lignite to Produce Chemicals in High-Temperature Water, Weize Wu, Wenhua Wang, Muge Niu, Jiahe Yan, Beijing University of Chemical Technology; Yucui Hou, Taiyuan Normal University, CHINA

Utilization of Photocatalytic Reactions to Conversion of Different Rank Coals and CO₂ into Methanol, Zhang Ya-ting, Zhou An-ning, Liu Guo-yang, Cai Jiang-tao, Si Yun-peng, Xi'an University of Science and Technology, CHINA

Mercury, Trace Elements Release Characteristics during Integrated Process of Coal Pyrolysis with Methane Steam Reforming of Low-Rank Coals, Haoquan Hu, Yang Li, Lijun Jin, Chan Dong, Yongchun Zhao, Dalian University of Technology, CHINA

Fundamentals and Pilot Test for Jetting Pre-oxidation Fluidized Bed Gasification Adapting to Caking Coal, Zhiqiang Zhao, Juwei Zhang, Feixiang Zhao, Xi Zeng, Guangwen Xu, Chinese Academy of Sciences, CHINA

Behavior of Mercury Oxide over Activated Carbon in Simulated Coal Combustion Flue Gas by Temperature Programmed Decomposition Desorption-Mass, Shengji Wu, Hangzhou Dianzi University, CHINA; Risa Katayama, Azhar Uddin, Eiji Sasaoka, Okayama University, JAPAN

Mechanical Activation Method for Preparation of Carbon Sorbents, Zinifer Rishatovich Ismagilov, Tatyana Sergeevna Manina, Natalia Ivanovna Fedorova, Institute of Coal Chemistry and Material Science SB RAS, RUSSIA

Coal Pore Structure, Zinifer Rishatovich Ismagilov, Institute of Coal Chemistry and Material Science SB RAS; Nadezhda Vas'evna Shikina, Boreskov Institute of Catalysis SB RAS; Natalia Viktorovna Zhuravlyova, Roza Ravilevna Potokina, JSC West-Siberian Mining Test Center; Tatiana Nikolaevna Teryaeva, Kuzbass State Technical University, RUSSIA

Modeling of Lignin Pyrolysis Based on Bond Dissociation and Fragments Coupling, Xiaojin Guo, Zhenyu Liu, Qingya Liu, Lei Shi, Beijing University of Chemical Technology, CHINA

Research on Crushing Mechanism and Separation Characteristic of ZGM Coal Mill, Hua Wei, China Yaquan He, Shuai Wang, Linhan Ge, Fengnian Shi, Nianxing Zhou, University of Mining and Technology, CHINA

ANFIS-Based Level Control System for Flotation Column, Cheng Sheng, China University of Mining and Technology; Jingya Wen, Inner Mongolia University of Science and Technology, CHINA

Arsenic Occurrence and Enrichment in Single Pyrite Segregated by Float-Sink in Coal Sample from Guizhou, China, Chong Tian, Junying Zhang, Yongchun Zhao, Chuguang Zheng, University of Science and Technology, CHINA; Rajender Gupta, University of Alberta, CANADA

Reaction of Carbon Disulfide and Magnesium during Milling with Carbonized Anthracite as Milling Aid, Haipeng Chen, Dexi Wang, Shixue Zhou, Huichao Chu, Binghui He, Min Tian, Shandong University of Science and Technology, CHINA

Development of Alumina & Silica-Based High Valuable Products from Fly Ash, Xiaohuan Wang, Baodong Wang, Xiaoting Liu, Yongfeng Xiao, Lijun Zhao, Gengzhi Yu, Qi Sun, National Institute of Clean-and-Low-Carbon Energy, CHINA

A Study on Sintering Process of Alumina Extraction from Fly Ash, Yongfeng Xiao, Baodong Wang, Xiaoting Liu, Lijun Zhao, Xiaohuan Wang, Qi Sun, National Institute of Clean-and-Low-Carbon Energy, CHINA

Inorganic Particle Formation in Blended Coal Combustion, Bin Fan, Xianpeng Zeng, Dunxi Yu, Minghou Xu, Huazhong University of Science and Technology, CHINA

The Mechanism of Gravity Shedding of Ash Deposits in Coal Fired Boiler, Naoki Sato, Shunichiro Ueno, Hiroshi Aramaki, IHI Corporation; Yoko Nunome, Yasuaki Ueki, Ryo Yoshiie, Ichiro Naruse, Nagoya University, JAPAN

Investigation on the Correlation between Coal Property and Combustion Character of Low Rank Coal, Deting

Kong, Yajun Tian, Xin Cui, Aiguo Liu, Haiyun Lu, Aiguo Chen, Ke Liu, National Institute of Clean-and-Low-Carbon Energy, CHINA

Arsenic Physical and/or Chemical Adsorption by CaO during Cooling Process of Simulated Air and Oxy-fuel Combustion Flue Gas, Hongyun Hu, Dun-Kui Chen, Zhang Xu, Kai-Di Li, Huan Liu, Ai-Jun Li, Hong Yao, Huazhong University of Science and Technology, CHINA

Petrology and Mineralogy of the Super-High-Organic-Sulfur Coals of Late Permian from Chenxi Coalfield, Southern China, Weiwei Li, Yuegang Tang, China University of Mining & Technology, CHINA

Roles of Anthracite Coal in Preparation of Magnesium-Based Hydrogen Storage Materials, Shixue Zhou, Weixian Ran, Qianqian Zhang, Haipeng Chen, Naifei Wang, Tao Li, Shandong University of Science and Technology, CHINA

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