Chemical Looping 2018

5th International Conference on Chemical Looping

24-27 September 2018, Park City, Utah

PRELIMINARY Program Schedule

Last updated: August 13, 2018

	MONDAY, SEPTEMBER 24TH - AFTERNOON AND EVENING
16:00 - 19:00	**REGISTRATION**
16:00 - 18:00	**Poster Presenters Set Up Posters**
18:00 - 20:00	**WELCOME RECEPTION**

TUESDAY, SEPTEMBER 25TH - EARLY MORNING

09:00 - 09:10	**Welcoming Remarks** Kevin Whitty, University of Utah, USA
09:10 - 09:50	**Keynote #1** Anders Lyngfelt, Chalmers University of Technology, SWEDEN
09:50 - 10:30	**Keynote #2** John Bullock, Babcock & Wilcox, USA
10:30 - 11:00	**BREAK**

TUESDAY LATE MORNING

	Oxygen Carriers 1	Pilot Plants 1	Novel Processes 1
11:00 - 11:20	**Chemical looping combustion: An oxygen carrier production cost study** Robert Stevens, U.S. DOE/NETL, UNITED STATES	**Improving the Performance of the Chemical Looping Combustion Process with Coal in a 50 kWth Unit** Alberto Abad, Instituto de Carboquímica (ICB-CSIC), SPAIN	**A Preliminary Study on the Use Of CaO as Sorbent for Sorption Enhanced Methanation** Fabrizio Scala, University of Naples Federico II, ITALY
11:20 - 11:40	**Development of Magnetic Mn-Fe Support Materials for CLC Applications** Pilar Gayan, Instituto de Carboquimica (ICB-CSIC), SPAIN	**Operation of a 50-kW Chemical Looping Combustion Test Facility Under Autothermal Conditions** Samuel Bayham, U.S. DOE/NETL, UNITED STATES	**Chemical Looping Partial Oxidation of Light Paraffins with Mixed-Oxide Redox Catalysts** Fanxing Li, North Carolina State University, UNITED STATES
11:40 - 12:00	**Effect of supports on the phase stability of $NiFe_2O_4$ in chemical looping process** Zhong Ma, Southeast University, CHINA	**Chemical-Looping Combustion in a 100 kW Unit Using a Mixture of Synthetic Calcium Manganite and Natural Ilmenite as Oxygen Carrier** Ivan Gogolev, Chalmers University of Technology, SWEDEN	**Investigation of $YBaCo_4O_{7+\delta}$ for oxygen looping processes at low temperatures** Wenting Hu, Newcastle University, UNITED KINGDOM
12:00 - 12:20	**Improved Impregnation Techniques for Manufacture of Oxygen Carriers** Kyle O'Malley, University of Utah, UNITED STATES	**Solid Circulation Characterisitcs and Preliminary Test Results in a 0.5 MWth Chemical Looping Combustor** Ho-Jung Ryu, KIER, KOREA	**Characterization of Limestone Calcination-Carbonation for Thermochemical Energy Storage Applications** Fabio Montagnaro, University of Naples Federico II, ITALY
12:20 - 12:40	**Influence of Heat Treatment On Manganese Ores as Oxygen Carriers** Tobias Mattisson, Chalmers University of Technology, SWEDEN	**Chemical Looping Pilot Operation in 1 MWth Scale Lessons Learnt and The Way Forward** Jochen Ströhle, TU Darmstadt, GERMANY	**Low-Pressure Ammonia Synthesis via Chemical Looping** Hanjing Tian, West Virginia University, UNITED STATES
12:40 - 14:00	**LUNCH**		

TUESDAY AFTERNOON

	Oxygen Carriers 2	Pilot Plants 2	Novel Processes 2
14:00 - 14:20	**Exploiting the Chemical Memory of Non-Stoichiometric Materials in Chemical-Looping Processes** Ian Metcalfe, Newcastle University, UNITED KINGDOM	**Effects of a Two-Stage Fuel Reactor on Chemical Looping Combustion with Methane, Bituminous Coal, Lignite and Wood Biomass** Johannes Haus, Technical University Hamburg, GERMANY	**Chemical Looping CO2 Activation via Methane Cracking and Iron Oxide Lattice Oxygen Transport** Martin Keller, The University of Tokyo, JAPAN
14:20 - 14:40	**Oxygen Carrier Attrition via a Jet Cup Under Elevated Temperature Conditions** Samuel Bayham, ORISE, UNITED STATES	**Chemical Looping Combustion of biomass in a 50 kWth unit** Francisco García-Labiano, Instituto de Carboquímica (ICB-CSIC), SPAIN	**Ultrafine Hematite Reduction in a Spouting Bed Chemical Looping Reactor** Ronald Breault, U.S. DOE/NETL, UNITED STATES
14:40 - 15:00	**Reactive Jet Attrition Analysis of Ilmenite in Chemical Looping Combustion Systems** Teagan Nelson, Envergex, LLC, UNITED STATES	**First Results from an 80 kW Dual Fluidized Bed Pilot Unit for Solid Fuels at TU Wien** Stefan Penthor, Technische Universität Wien, AUSTRIA	**Chemical looping CH4 decomposition and CO2 reduction over Ce/Ni doped Ca2FexAl2-xO5 catalyst: A new pathway for continuous CO2 conversion with almost-pure H2 and CO** Zhao Sun, Southeast University, CHINA
15:00 - 15:20	**The melting characteristics of ilmenites and manganese ores in chemical looping combustion** Lei Liu, Tsinghua University, CHINA	**Experience with Chemical Looping Combustion of Coal in a 200 kW Dual Fluidized Bed Reactor** Kevin Whitty, University of Utah, UNITED STATES	**Iron-Based Chemical-Looping Technology for Decarbonising Iron and Steel Production** Husain Bahzad, Imperial College London, UNITED KINGDOM
15:20 - 15:40	**Ageing and Characterization of CaMn0,775Ti0,1Mg0,1O3-δ Particles in a 10 kWth CLC Pilot Plant** Arnold Lambert, IFP Energies nouvelles, FRANCE	**Scale-Up Operation of a 110 MWth Biomass Fired CFB-Boiler With Oxygen Carriers as Bed Material** Patrick Moldenhauer, Chalmers University of Technology, SWEDEN	**Chemical looping partial oxygen uncoupling combustion of CuFe2O4 with a typical Chinese anthracite activated by K2CO3** Baowen Wang, North China University of Water Resources and Electric Power, CHINA
15:40 - 16:00	**Study of The Physical and Chemical Stability of a Cu-Based Impregnated Oxygen Carrier at Different Temperatures and Conversion Ratios** Luis F. de Diego, Instituto de Carboquimica (ICB-CSIC), SPAIN	**100 kWth Three Towers Chemical Looping Coal Combustion experiment** Tomonao Saito, Japan Coal Energy Center, JAPAN	**Design of Micro Chemical Looping Reactor for Oxygen Carrier Assessment** Tianxu Shen, Southeast University, CHINA
16:00 - 18:00	**POSTER SESSION**		

WEDNESDAY, SEPTEMBER 26TH - EARLY MORNING

08:30 - 9:10	**Keynote #3** Ranjani Siriwardane, U.S. Dept of Energy / NETL, USA		
	Oxygen Carriers 3	**Air Separation Technologies**	**Hydrogen Production 1**
09:20 - 09:40	**Perovskite Oxides as Oxygen Carriers for Selective Hydrogen Combustion and Light Paraffin Conversion** Xin Tian, North Carolina State University, UNITED STATES	**High Performance Copper Manganese Spinel Oxides for Low-Cost Oxygen Production and Other Chemical-Looping Applications** Clemens Patzschke, Imperial College London, UNITED KINGDOM	**30 kWth Moving Bed Chemical Looping System Progress for Hydrogen Production in ITRI** Cetera Chen, Industrial Technology Research Institute, TAIWAN
09:40 - 10:00	**Superior Lattice Oxygen Reactivity over Ni Modified WO3-based Redox Catalysts for Chemical Looping Partial Oxidation of Methane** Liang Zeng, Tianjin University, CHINA	**Process design and simulation of a dual fluidized bed reactor for chemical looping air separation** Bo Jin , Hunan University, CHINA	**Experimental investigation on iron oxide oxygen carriers with macropores for Chemical Looping Hydrogen Generation** Jun Hu, Shiyi Chen, Wenguo Xiang, Southeast University, CHINA
10:00 - 10:20	**LD Slag Used as Oxygen Carrier In Combustion Processes** Fredrik Hildor, Chalmers University of Technology, SWEDEN	**Reduction and Oxidation Behavior of Strontium Perovskites for Chemical Looping Air Separation** Felix Donat, University of Cambridge, UNITED KINGDOM	**Using La0.6Sr0.4FeO3-δ for chemical looping hydrogen production** Christopher de Leeuwe, Newcastle University, UNITED KINGDOM
10:20 - 10:40	**Chemical looping combustion of lignite with CaSO4-Mn3O4 mixed oxygen carrier prepared using the template mediated sol-gel combustion synthesis method** Baowen Wang, North China University of Water Resources and Electric Power, CHINA	**Chemical looping for oxygen production (CLOP) as part of the COMPOSITE concept for high efficiency power production with integrated CO2 capture from solid fuels** Yngve Larring, SINTEF Industry, NORWAY	**Reaction Front Moving Behaviour in Complex Atmosphere (CO/H2/CO2) of Deep Reduction under Chemical Looping Hydrogen Generation** Iwei Wang, Tsinghua university, CHINA
10:40 - 11:00	**BREAK**		

WEDNESDAY LATE MORNING

	Oxygen Carriers 4	Carbonate Looping	Hydrogen Production 2
11:00 - 11:20	**Dynamic Study on Combustion Mechanism of Char Chemical Looping over Surface Calcium-doped Copper Oxide** Hanjing Tian, West Virginia University, UNITED STATES	**Preparation of Cage-Like CaO/CuO Hollow Spheres for Enhanced CO2 Capture in Combined Ca-Cu Looping** Jian Chen, Southeast University, CHINA	**Iron based oxygen carriers for hydrogen production - improved long term stability and in-situ time-resolved investigation** Yoran De Vos, Ghent University/VITO, BELGIUM
11:20 - 11:40	**Preventing agglomeration of Cu-based oxygen carriers for high-temperature chemical looping applications** Felix Donat, ETH Zürich, SWITZERLAND	**The Effect of Sulfur Dioxide and Steam on the CO2 Capture in Calcium Looping: Comparison Between Two Limestones** Fabio Montagnaro, University of Naples Federico II, ITALY	**Direct production of high-pressure hydrogen with the fixed bed RESC process** Viktor Hacker, TU Graz, AUSTRIA
11:40 - 12:00	**Behaviour of Cu-based oxygen carrier with the presence of coal ash in chemical looping with oxygen uncoupling** Changlei Qin, Chongqing University, CHINA	**Effect of K+ on the calcium looping sorbents modified by hydration-impregnation method for CO2 capture** Jiaxin Xu, Huazhong University of Science and Technology, CHINA	**An Advancement In CO2 Utilization Through Novel Gas Switching Dry Reforming** Ambrose Ugwu, Norwegian University of Science and Technology, NORWAY
12:00 - 12:20	**Effects of coal ash on the performance of Cu-based oxygen carriers** Jinze Dai, University of Utah, UNITED STATES	**Promoting multicyclic activity of sorbents for CO2 capture in calcium looping process under the constraints of economic feasibility** Kumar R Rout , Norwegian University of Science and Technology, NORWAY	**H2 production from a plasma-assisted chemical looping system from the partial oxidation of CH4 at mild temperatures** Stuart Scott, University of Cambridge, UNITED KINGDOM
12:20 - 12:40		**A high efficient and durable CO2 sorbent derived from calcium-based metal-organic framework material for calcium looping application** Bo Jin, Hunan University, CHINA	**Chemical Looping Methane Decomposition for the Production of Carbon-Free Hydrogen and Base Growth Carbon Nanotubes over Transition Metal Aerogels** Bingying Gao, West Virginia University, UNITED STATES
12:40 - 14:00	**LUNCH**		

WEDNESDAY AFTERNOON

	Modeling - Reactors	Reactor Design 1	Gasification 1
14:00 - 14:20	**Development of a one-dimensional bubbling fluidized bed model for chemical looping combustion of coal with oxygen uncoupling** Petteri Peltola, Lappeenranta University of Technology, FINLAND	**Syngas Chemical Looping Combustion with Allothermal Gasification** Peter Ohlemüller, TU Darmstadt, GERMANY	**Effect of Al2O3 addition in process of lignite Chemical Looping Gasification based on CaO Sorbent** Leming Cheng, Zhejiang University , CHINA
14:20 - 14:40	**Modelling and experimental study of a petcoke conversion with an oxygen carrier in a batch fluidized bed** Airy Tilland, IFP Energies Nouvelles, FRANCE	**Experimental Study of Chemical Looping Combustion in a Pressurized Internally Circulating Reactor** Mogahid Osman, Norwegian University of Science and Technology, NORWAY	**Methane-to-Syngas Conversion Over Intellegent Iron Based Perovskite Catalyst** Chuande Huang, Dalian Institute of Chemical Physics, CHINA
14:40 - 15:00	**Process Simulation and Optimization of Chemical Looping Combustion for Mixtures of Coal and Biomass using an Iron Based Oxygen Carrier** Ramesh K. Agarwal, Washington University in St. Louis, UNITED STATES	**Research And Development of a CLC Boiler with an Internally Circulating Fluidized Bed** Takamichi Hosono, Kawasaki Heavy Industries Ltd, JAPAN	**Production of CO and Hydrogen Via Chemical Looping Gasification of Coal with Calcium Ferrite and Oxidation with Steam** Ranjani Siriwardane, U.S. DOE/NETL, UNITED STATES
15:00 - 15:20	**Modelling of Fluidized Bed Reactors for Three Reactor Chemical Looping Configuration** Ratnakumar Kappagantula, Curtin University, AUSTRALIA	**Method for Separation of Coal Conversion Products from Sorbent/Oxygen Carriers** Junior Nasah, University of North Dakota, UNITED STATES	**Effective Generation of Syngas via Chemical Looping CH4 Conversion and H2O-CO2 Splitting** Xing Zhu, Kunming University of Science and Technology, CHINA
15:20 - 15:40	**Experimental Investigation and Flowsheet Simulation of the Dynamics in a Chemical Looping Combustion System** Lennard Lindmuller, Hamburg University of Technology, GERMANY	**Effect of Potassium-Enriched Ilmenite Bed Particles on Corrosion of Heat Transfer Materials in Chemical Looping Combustion** Jan-Erik Eriksson, Åbo Akademi University, FINLAND	**Hexaaluminate as Oxygen Carrier for Syngas Generation via Chemical Looping CH4-CO2 Reforming** Yanyan Zhu, Northwest University, CHINA
15:40 - 16:00	**BREAK**		
16:00 - 22:30	**UNIVERSITY OF UTAH COMBUSTION FACILITY TOUR AND CONFERENCE BANQUET**		

THURSDAY, SEPTEMBER 27TH - EARLY MORNING

08:30 - 9:10	**Keynote #4** (to be confirmed)		
	Modeling - Process and Technoeconomic	**Reactor Design 2**	**Gasification 2**
09:20 - 09:40	**Methane to Syngas by Chemical Looping using Fe-Ni Oxygen Carriers: Reactor Design and Process Modeling** Hari Mantripragada, University of Pittsburgh, UNITED STATES	**CHEERS pilot plant, an original design dedicated to CLC efficiency** Florent Guillou, IFPEN, FRANCE	**Chemical Looping Gasification of Biomass Pellets With a Manganese Ore as Oxygen Carrier** Tao Song, Nanjing Normal University, CHINA
09:40 - 10:00	**Process integration of chemical looping combustion with oxygen uncoupling in a biomass-fired combined heat and power plant** Petteri Peltola, Lappeenranta University of Technology, FINLAND	**Heat balance analysis of a 3 MWth pilot plant for CLC demonstration** Hu Chen, Tsinghua University, CHINA	**Influence of Bed Material Cycle Rate and Temperatures on the CO2 Transport during Sorption Enhanced Reforming of Biomass** Anna Mauerhofer, Vienna University of Technology, AUSTRIA
10:00 - 10:20	**Economic Analysis of Pressurized Chemical Looping Combustion for SAGD Applications** Robin Hughes, CanmetENERGY, CANADA	**Application of MP-PIC on dual interconnected chemical looping cold flow system: Validation process with hydrodynamic experiments** Matthew Hamilton, CPFD Sofware Inc., UNITED STATES	**Chemical Looping Gasification of Lignin Biomass with Bimetallic Oxygen Carriers** Jingli Wu, West Virginia University, UNITED STATES
10:20 - 10:40	**Thermodynamic and Economic Evaluation of a Full Scale Chemical Looping Plant** Peter Ohlemüller, TU Darmstadt, GERMANY	**Dynamic Characteristics on a Cold-model of Gushing Reactor for Intensifying Chemical Looping Process** Xiao Zhu, Southeast University, CHINA	**Hydrogen-rich Gas Derived From Biomass Through Chemical Looping Gasification Using Nickel Ferrite Oxygen Carrier** 0, Guangzhou Institute of Energy Conversion, CHINA
10:40 - 11:00	**BREAK**		

THURSDAY LATE MORNING

	Modeling - CFD	Reactor Operation 1	Gasification 3
11:00 - 11:20	**CFD Simulations of Chemical Looping Combustion in a Packed Bed and a Bubbling Bed Fuel Reactor** Ramesh K. Agarwal, Washington University in St. Louis, UNITED STATES	**Coal and biomass combstion by Chemical looping with oxygen uncoupling (CLOU) with Cu and Cu-Mn materials.** Juan Adanez, Instituto de Carboquímica (ICB-CSIC), SPAIN	**Y Promoted Fe2O3/Al2O3 as Oxygen Carriers for Syngas Production** Yu Kang, Dalian Institute of Chemical Physics, CHINA
11:20 - 11:40	**Three dimensional full loop simulation for a coal-direct chemical looping system with an improved air reactor** Yali Shao, Southeast University, CHINA	**Evaluation of Chemical Looping Combustion Behaviour Using Victorian Brown Coal with Ilmenite** Sankar Bhattacharya , CSIRO Energy, AUSTRALIA	**Catalyst-Assisted Chemical Looping Auto-Thermal Dry Reforming: The Effect of Operating Pressure** Jiawei Hu, Ghent University, BELGIUM
11:40 - 12:00	**Computational simulation of a dual circulating fluidized bed reactor processing coal by chemical looping with oxygen uncoupling** Zachary Reinking, University of Utah, UNITED STATES	**Evaluation of Coal Conversion in a Fluidized Bed Chemical Looping Reactor Using Copper-Based Oxygen Carriers** Kirsten Merrett, University of Utah, UNITED STATES	**Reactivity of layered double hydroxides derived Fe-Ni-Al-O oxygen carriers for chemical looping reforming process** Yihan Fan, Hunan University, CHINA
12:00 - 12:20	**CPFD Simulation and Optimization For a 50 kWth Dual Circulating Fluidized Bed Reactor For Chemical Looping Combustion Of Coal** Chen Xi, Huazhong University of Science and Technology, CHINA	**NO and NH3 conversion over Ilmenite and iron oxide** Henrik Leion, Chalmers University of Technology, SWEDEN	**Moving Bed Chemical Looping Process Development for Syngas and Hydrogen Production from Fossil and Renewable Fuels** Andrew Tong, Ohio State University, UNITED STATES
12:20 - 12:40	**Application of Recent CFD Advancements to the Modeling of Chemical Looping Systems** James Parker, CPFD Sofware Inc., UNITED STATES	**Systematic Investigation on Sulfur Behaviour in Coal-Derived In-Situ Gasification Chemical Looping Combustion Process** Jinchen Ma, Huazhong University, CHINA	**Packed Bed Chemical Looping Reforming Process for Bulk Chemicals** Vincenzo Spallina, University of Manchester, UNITED KINGDOM
12:40 - 14:00	**LUNCH**		

THURSDAY AFTERNOON

	Modeling - Chemical Reactions	Reactor Operation 2	(no session)
14:00 - 14:20	**Experimental Study and Particle Scale modeling of a CuO-Fe2O3-Al2O3 oxygen carrier for Chemical Looping combustion applications** Jarrett Riley, U.S. DOE/NETL, UNITED STATES	**Effect of Volatile on Natural Iron-Based Oxygen Carriers during Long Operation of Chemical Looping Combustion of Victorian Brown Coal** Imtenan Sayeed, Monash University, AUSTRALIA	
14:20 - 14:40	**Products distribution and kinetic analysis during chemical looping with oxygen uncoupling of lignocellulosic biomass main compound** Zhiqiang Wu, Xi'an Jiaotong University, CHINA	**Coal-fired chemical-looping combustion coupled with a high efficient annular carbon stripper** Mao Cheng, Tsinghua University, CHINA	
14:40 - 15:00	**Reaction kinetics analysis of char under conditions of low oxygen and high carbon dioxide concentration in chemical looping with oxygen uncoupling** Ye Li, Tsinghua University, CHINA	**Industrial Implementation of Oxygen Carrier Aided Combustion** Angelica Corcoran, Chalmers University of Technology, SWEDEN	
15:00 - 15:20	**Reduced Chemical Mechanim for Chemical Looping with Oxygen Uncoupled Combustion System** Hong-Shig Shim, Reaction Engineering International, UNITED STATES	**Bio-CLC Pilot Scale Experiments Combined with CFD Simulations: How to Improve the Performance by Better Design?** Toni Pikkarainen, VTT Technical Research Centre, FINLAND	
15:20 - 15:40	**Beneficial Effect of Ca/Sr at A-site and Cu at B-site Substitution of LaNiO3 on Solar-thermal Chemical Looping hydrogen production** Hong Hui, Institute of Engineering Thermophysics, CHINA		
15:40 - 16:00	**BREAK**		
16:00 - 17:00	**PANEL DISCUSSION** Moderated by JoAnn Lighty, Boise State University, USA		
	CLOSE OF CONFERENCE		