

International Conference on Carbon Dioxide Utilisation

Monday 12th September 2016

8.45 – 9.00	<p>LT1: Welcome: Prof Jim Litster, Head of Department, Chemical and Biological Engineering Prof Peter Styring, Chair of Local Organising Committee Prof Chunshan Song, Chair of International Organising Committee</p>		
9.00- 9.45	<p>LT1: Plenary: Dr Christoph Gürtler, Covestro Chair: Chunshan Song</p>		
9.50- 10.20	<p>Keynote: Dr Stefanie Schlager, Johannes Kepler University Chair: Aaron Appel</p>	<p>Keynote: Professor Arjun Kelij, Institute of Chemical Research of Catalonia (ICIQ) Chair: Mike North</p>	<p>Keynote: Professor Peter Styring, University of Sheffield Chair: Chunshan Song</p>
10.20- 10.50	Coffee		
	<p>ElectroChemistry Chair: Aaron Appel</p>	<p>Cyclic carbonates Chair: Mike North</p>	<p>Capture Chair: Chunshan Song</p>
10.50- 11.10	<p>Prof Richard I. Masel Dioxide Materials, The effect of membrane composition on CO₂ electrolysis using novel Sustainion™ membranes</p>	<p>Claudio Mota Federal University of Rio de Janeiro Zeolite Y Impregnated with Metal Halides as Efficient Heterogeneous System for the Synthesis of Cyclic Carbonates</p>	<p>Lidija Siller University of Newcastle, Nickel nanoparticles (NiNPs) versus nickel nanowires (NiNWs): increased activity towards CO₂ carbon capture in water solutions</p>
11.10- 11.30	<p>Marjut Suomalainen VTT Technical Research Centre for Finland, Utilisation of SOEC simulation model both in experimental data analysis and in techno-economic evaluation</p>	<p>Paul Reiss University of York, Immobilisation of a Bimetallic Aluminium-Salen Complex onto a Structured Silica Support and its Influence on Cyclic Carbonate Synthesis</p>	<p>Dongwoo Kang Yonsei University, Carbon dioxide utilisation using concentrated industrial wastewater through aqueous approach</p>
11.30- 11.50	<p>Ann Call, University of Sheffield, Investigation of Co-Electrolysis Processes in Solid Oxide Cells using Electrochemical and Surface Spectroscopy Methods</p>	<p>Carmine Capacchione Università di Salerno New [OSSO]-type iron(III) complexes as efficient catalysts for the coupling of carbon dioxide with epoxides</p>	<p>Rebecca Taylor Queen's University Belfast CO₂ Capture and Electrochemical Conversion Utilisation in Superbase Ionic Liquids</p>
11.50- 12.10	<p>Xavier Angles UCL, A DFT Study of the Catalytic Activity of Ni Nanoparticles on Yttria-Stabilized Zirconia and Gadolinium-Doped Ceria (111) Surfaces for Solid Oxide Fuel Cell Applications</p>	<p>Xiao Wu University of York, Synthesis of Cyclic Carbonates Catalysed by Chromium and Aluminium(Salphen) Complexes</p>	<p>Robert Dawson University of Sheffield, Carbon capture in Microporous Organic Polymers</p>
12.10- 12.30	<p>Denis Cumming University of Sheffield The Chemical Server: Materials and devices for on demand conversion of CO₂ directly to chemicals</p>	<p>Richard H. Heyn, SINTEF, Mechanistic studies into the formation of propylene carbonate from propylene glycol and CO₂</p>	<p>Xiaoxing Wang Pennsylvania State University, Advanced Solid Sorbents for CO₂ Capture from Flue Gas</p>
12.30- 13.30	Lunch		

13.30-15.30	Flash Presentations Please see separate timetable for this session		
15.30-16.00	Coffee		
	PtoX Chair: Youssef Travely	CO2-Derived Fertilisers and Carbamates Chair: Willy Offermans	TEA/LCA Chair: Stefan Bringazu
16.00-16.20	Heriberto Pfeiffer, Universidad Nacional Autonoma de Mexico CO2 capture on alkaline ceramics and its catalytic conversion to added value products	Peter Hammond, CCm Research, Utilisation of Carbon Dioxide within Biogenic Fertiliser Production	Rebecca Frauzem, Technical University of Denmark, A generic methodology for the design of sustainable carbon dioxide utilization processes using superstructure optimization
16.20-16.40	Mr Iker García García, Faculty of Engineering (UPV/EHU), Spain Power-to-Gas: Storing Surplus Electrical Energy. Catalytic systems based on unconventional supports.	Mei-Yan Wang, Nankai University, Upgrading carbon dioxide by incorporation into heterocycles: Carboxylative cyclization of propargylic amines with CO2 promoted by bifunctional polyoxometalate-based ionic liquids	Arno Zimmerman, TU Berlin, Techno-economic-environmental assessment: state of literature and integrated assessment method for CO2-utilization in chemicals production
16.40-17.00	Dennis Krämer, Dechema, Power to X: Drawbacks and opportunities	Terry Makenyire, University of Sheffield Ionic Liquids as Catalysts for the Synthesis of Urea and N,N' Disubstituted Ureas From Carbon Dioxide	Ioanna Dimitriou, University of Sheffield, Production of Synthetic Gasoline and Diesel from Carbon Dioxide/Methane Reforming: A Comprehensive Techno-economic Assessment
17.00-17.20	Karen Callebaut, Antwerp Port Authority Power-to-Methanol and CCU potential	Min-Gu Lee, Yonsei University Introduction of various processes for the carbon dioxide utilization using ammonia compounds	Sarah, Deutz, RWTH Aachen University, Reactions with benefits? Screening the environmental potential of CO2 reactions
17.20-17.40	Steven Chiuta, North-West University South Africa, Power-to-methane and power-to-syngas business models for sustainable carbon dioxide utilization in coal-to-liquid facilities: A techno-economic assessment	Richard Heyn SINTEF Experimental and theoretical investigations of industrially relevant binary CO2-propylene oxide and ternary CO2-propylene oxide-poly(propylene carbonate) systems	Dimitri Mignard, University of Edinburgh, Simulating a chemical process for the co-utilization of electrolytic hydrogen and CO2 at variable feed rate.
17.40 – 19.00	SCOT Matchmaking Event WORKROOM 2 Find partners for your research		

International Conference on Carbon Dioxide Utilisation
Tuesday 13th September 2016

9.00-9.45	<p align="center">Plenary: Professor Ron Zevenhoven Åbo Akademi University Chair: Mike North</p>		
9.50-10.20	<p align="center">Keynote: Professor Chang-Jun Liu, Tianjin University Chair: Nannan Sun</p>	<p align="center">Keynote: Professor Walter Leitner, RWTH Aachen University Chair: Christoph Guertler</p>	<p align="center">Keynote: Bernard David, Global CO2 Initiative Chair: Peter Styring</p>
10.20-10.50	<p align="center">Coffee</p>		
	<p align="center">CO2 Reduction + Capture Chair: Nannan Sun</p>	<p align="center">CO2-Derived Acids Chair: Christoph Guertler</p>	<p align="center">Policy Chair: Peter Styring</p>
10.50-11.10	<p align="center">Aaron Appel, Pacific Northwest National Laboratory Using free energy for H-plus and H-minus transfers to design catalysts for the reduction of CO2.</p>	<p align="center">Sang Eon Park, Inha University, Utilization of methane and carbon dioxide in continuous process for direct formation of acetic acid</p>	<p align="center">Bu Jie, A*STAR The Impact of CO2 Emissions Data Management and Scenario Predictions on National Energy Policies</p>
11.10-11.30	<p align="center">Reynald Henry University of Oslo, Study of CO2 reduction by cerium oxide nanoparticles with transient response experiments</p>	<p align="center">George Dowson, University of Sheffield, Direct conversion of carbon dioxide from the gas phase under mild conditions using reactive metal cycling</p>	<p align="center">Henriette Naims, Institute for Advanced Sustainability Studies, CO2 Recycling – An Option for Policymaking and Society? Twelve Theses on the Societal and Political Significance of Carbon Capture and Utilisation (CCU) Technologies</p>
11.30-11.50	<p align="center">Himeda Yuichiro, AIST, Efficient Iridium Catalysts with Imidazoline Ligands for CO2 Hydrogenation</p>	<p align="center">Wen-Zhen Zhang, Dalian University of Technology, Sequential organic reactions using carbon dioxide</p>	<p align="center">Hans Bolscher, Trinomics How CCU is affected by European policies in general and on CCS and ETS especially</p>
11.50-12.10	<p align="center">Chunshan Song Pennsylvania State University, Bimetallic Pd-Cu Catalysts for CO2 Hydrogenation to Methanol</p>	<p align="center">Ben Buckley, Loughborough University, Exploiting Electrosynthesis to Enable Selective Hydrocarboxylation</p>	<p align="center">Stefanie Roth, Forschungszentrum Jülich GmbH From Waste to Resource - Can CO2 replace crude oil in the future?</p>
12.10-12.30	<p align="center">Sunil Josi, National Chemical Laboratory Hydrogenation of Carbon Dioxide to N, N dimethyl formamide using Hydrotalcites as a catalyst</p>	<p align="center">Gaia Neri University of Liverpool A Highly Active Nickel Electrocatalyst shows Excellent Selectivity for CO2 Reduction in Acidic Media</p>	<p align="center">Ted Grozier, ClimateKIC, EnCO2re: Achievements and Ambitions in Enabling CO2 Re-use</p>
12.30-12.50	<p align="center">Dan Reed, University of Sheffield, Advances in pressure swing carbon capture using low complexity sorbents</p>	<p align="center">Xinkui Wang Dalian University of Technology A Schiff base modified gold catalyst for efficient carbon dioxide hydrogenation to formic acid</p>	<p align="center">Youssef Travely SCOT What are the strategic research and innovation targets for CO2 utilisation? Findings of the SCOT Project</p>
12.50-13.50	<p align="center">Lunch</p>		

	Plasma Reactions Chair: Rachel Elder	Mineralisation Chair: Alissa Park	Carbon Capture Chair: Hans Bolscher
13.50-14.10	Tom Butterworth, University of Sheffield Towards optimisation of packed bed plasma reactors for CO ₂ reduction	Yeo Tze Yuen, Institute of Chemical and Engineering Sciences, Singapore An Analysis of the Current State, Limitations, and Potential for Improvement of Direct Aqueous Pressure Carbonation Processes	Arturo Castillo-Castillo, Imperial College London Tipping point analysis of carbon capture and transportation
14.10-14.30	Bryony Ashford, University of Liverpool Conversion of CO ₂ into value-added chemicals in a packed bed plasma-catalytic reactor	Katie Joanna Lamb, University of York Electrochemically driven CO ₂ Capture and Mineralisation	Carla I. Costa Pinheiro Instituto Superior Técnico/Universidade de Lisboa Use of activated carbon in the synthesis of highly active and stable sol-gel CaO sorbents for CO ₂ capture
14.30-14.50	G Rooij, DIFFER Understanding dynamics of a pulsed microwave plasma for efficient CO ₂ dissociation	Abdallah Dindi, Masdar Institute of Science and Technology Carbon dioxide utilization for the production of precipitated silica and sodium bicarbonate	Nadeen Al-Janabi, University of Manchester Assessment of MOF's structure quality: quantifying defects content in crystalline porous materials; A case study: CuBTC
14.50-15.10	James Comerford, University of York, Synthesis of functionalized benzoic acids using non-thermal plasma generated carbon monoxide	Inseong Hwang Pusan National University Kinetics and Extent of Accelerated Carbonation of MgO-Based Binder	Susana Garcia Heriot Watt University CO ₂ capture using high-temperature lithium silicate sorbents: A process integration study
15.10-15.30	Khelifa Yanallah, University of Algeria/University of Sheffield Experimental and Numerical Investigation of CO ₂ Splitting in a Nanosecond Pulsed Corona Discharge.	Georg Baldauf-Sommerbauer Graz University of Technology Reductive Calcination - A means of Carbon Dioxide Utilisation in Minerals Processing	Shengping Wang Tianjin University Incorporation of (Zr-Ce) into Calcium Oxide for Improving the Stability of CO ₂ Capture Sorbent
15.30-18.00	Poster Session with Afternoon Tea		

International Conference on Carbon Dioxide Utilisation
Wednesday 14th September 2016

9.00-9.45	<p align="center">Plenary: Professor Andy Bocarsly Princeton University Chair: Peter Styring</p>		
9.50-10.20	<p align="center">Keynote: Professor Ah-Hyung (Alissa) Park, Columbia University Chair: Alessandra Quadrelli</p>	<p align="center">Keynote: Professor Mike North, University of York Chair: Richard Heyn</p>	<p align="center">Keynote: Dr Chris Jones, University of Sheffield and Dr. Barbara Olfe-Kräutlein, IASS Potsdam Chair: Katy Armstrong</p>
10.20-10.50	<p align="center">Coffee</p>		
	<p align="center">CO₂-Derived Fuels Chair: Alessandra Quadrelli</p>	<p align="center">CO₂-Derived Methanol Chair: Richard Heyn</p>	<p align="center">TEA/LCA Chair: Katy Armstrong</p>
10.50-11.10	<p align="center">Peter Edwards, University of Oxford Effective utilization of CO₂ in flue gas with alkane conversion</p>	<p align="center">Ki-Won Jun, Korea Research Institute of Chemical Technology (KRICT), Carbon Dioxide Utilization in a Gas-to- Methanol Process Composed of CO₂/Steam-Mixed Reforming and Methanol Synthesis</p>	<p align="center">Mar Perez-Fortes, European Commission, Joint Research Centre (JRC) Evaluation of the CO₂ utilisation potential of urea production</p>
11.10-11.30	<p align="center">Alan Chaffee, Monash University. Gas-Phase Conversion of CO₂ Using a MIL- 140C-(Ru) Metal-Organic Frameworks as Catalyst</p>	<p align="center">Andres Garcia Trencó, Imperial College London, Highly active Pd/Ga colloids for the liquid phase synthesis of methanol from CO₂</p>	<p align="center">Leonard Müller, RWTH Aachen University Selecting environmentally optimal CO₂ sources for CO₂ utilization</p>
11.30-11.50	<p align="center">Xinwen Guo, Dalian University of Technology A combined experimental and density functional theory study on Co/ZrO₂ and Co/Al₂O₃ catalysts for CO₂ methanation</p>	<p align="center">Feng Li, Chinese Academy of Science, Cu-based perovskite metal complex oxide catalysts for methanol synthesis from CO₂ hydrogenation</p>	<p align="center">Jin Xuan, Heriot-Watt University Energy and CO₂ emission assessment of CO₂-to-liquid electrochemical processes</p>
11.50-12.10	<p align="center">Peng Gao Shanghai Advanced Research Institute High-performance and long-lived Cu-ZnO- based catalysts for slurry methanol synthesis from CO₂ hydrogenation</p>	<p align="center">Sigrid Douven, University of Chester Utilisation of CO₂ from an Industrial source for Methanol production</p>	<p align="center">Stefan Bringezu, Kassel University Integration of renewable energy supply and carbon recycling for chemical production: Life cycle assessment of a CO₂-based production of basic chemicals and polymers</p>
12.10-12.30	<p align="center">Frans van Berkel, ECN, Thermodynamic limitations and how to overcome them in carbon utilization</p>	<p align="center">Christian Ahoba-Sam, University College of Southeast Norway, Low temperature methanol synthesis over copper nanoparticles</p>	<p align="center">Marvin Kant, TU Berlin An enabling start-up support system for CO₂ utilisation: A case study on barriers to commercial success</p>
12.30-13.30	<p align="center">Lunch</p>		
	<p align="center">Photocatalysis Chair: Andy Bocarsly</p>	<p align="center">Cyclic Carbonates Chair: Claudio Mota</p>	<p align="center">Biological Chair: Stefanie Schlagar</p>
13.30-13.50	<p align="center">Junwang Tang, University College London Visible light driven CO₂ conversion by rational designed junctions</p>	<p align="center">Willy Offermans, RWTH Aachen University On the Mechanism of the Cycloaddition of Carbon Dioxide and Epoxides</p>	<p align="center">Marianne Haberbauer, ACIB GmbH, Microbial electrosynthesis systems for the production of methane from CO₂</p>

13.50-14.10	Wei Chen, Shanghai Advanced Research Institute Size-Dependent Photoelectrocatalytic Reduction of CO ₂ over Graphene/SiC composites	Benjamin Bousquet, University of Lyon, Zn-azatrane complexes as efficient catalysts for CO ₂ conversion	Lindsey Garcia-Gonzalez, VITO, Biotechnological routes for valorization of CO ₂ to polymers
14.10-14.30	Alessandra Quadrelli, CPE Lyon, Carbon Dioxide Utilisation for Renewable energy harvesting : Context elements and examples with a Novel MOF-Based Photocatalyst	William Webb, University of Southampton Engineering heterogeneous organocatalysts for the sustainable utilisation of carbon dioxide	Seetharaman Vaidyanathan, University of Sheffield, Carbon dioxide uptake by microalgae and relevance to lipid accumulation
14.30-14.50	Mercedes Moto Valer, Herriot Watt University Solar Fuels from Photocatalytic Reduction of CO ₂ via Engineering innovation	Veronique Dufaud, CNRS, Organocatalysis in confined space for the production of cyclic carbonates from CO ₂ and epoxides	Karolien Vanbroekhoven, VITO Bioelectrochemical CO ₂ Reduction integrated with product separation: a prospect for future application
14.50-15.10	Yuaka Amao, Osaka City University, Visible-light induced conversion of carbon dioxide to formic acid with the system consisting of water-soluble zinc porphyrin and formate dehydrogenase electron- mediated bipyridinium salt	Antione Buchard, University of Bath Synthesis of 6-membered cyclic carbonates from 1,3-diols and low CO ₂ pressure: a novel mild strategy to replace phosgene reagents and enable new sustainable polymers from sugars	Nannan Sun Shanghai Advanced Research Institute CO ₂ fixation via microalgae and successional conversion to bulk chemicals
15.10-15.30	Coffee		
	CO₂-Derived Fuels Chair: Sang Eon Park	Organic Carbonates and Capture Chair Ajian Kelji	Enabling Technologies and LCA Chair: Annika Stute
15.40-16.00	Jere Elfving, VTT Technical Research Centre of Finland Supporting Power-to-X with CO ₂ Capture from air: Initial experiences, challenges and opportunities	Cecile Daniel, IRCELYON, Unravelling mechanisms of DMC synthesis from CO ₂ and MeOH on very active CeZr oxides	Steve Woolass Tata steel, The Application of Carbon Dioxide Capture and Utilisation Technologies within the Steel Industry
16.00-16.20	Hui Wang, Shanghai Advanced Research Institute Sustainable performance of Ni-based ferrite for thermochemical CO ₂ conversion into fuels	Amélie Boyaval, CNRS Université Bordeaux, Cyclic carbonates by organocatalytic coupling of CO ₂ with propargylic alcohol	Pelayo Garcia Gutierrez, University of Manchester Production of Liquid Fuels from Biogas through High-Temperature Co-Electrolysis of Steam and Carbon Dioxide: an Environmental Assessment
16.20-16.40	Grant Wilson, University of Sheffield, Why we need CO ₂ utilisation fuels in the future for energy integration	Markus Scharfenberg, Johannes Gutenberg University Multi-arm star polyether-polycarbonates based on tailored epoxides and carbon dioxide	Maria Grahn, Chalmers University of Technology, Cost-analysis utilizing CO ₂ in industrial flue gases for the production of electrofuels
16.40-17.00	Liguo Wang Chinese Academy of Sciences Influence of ordered mesoporous KIT-6, MCM- 41 and SBA-15 supported copper catalysts for the hydrogenation of ethylene carbonate derived from CO ₂	Nannan Sun Shanghai Advanced Research Institute Synthesis of high performance SAPO-34 zeolite membrane for CO ₂ capture	Zhiyong Tang Shanghai Advanced Research Institute Research of industry related carbon dioxide emission and opportunities of integrated systems in a carbon- constrained world
17.00-17.20		Nannan Sun Shanghai Advanced Research Institute One-pot solvent-free synthesis of mesoporous carbons and enhancing their low pressure CO ₂ adsorption by surface modification	Wei Chen Shanghai Advanced Research Institute Advanced manganese based electrocatalysts free of precious metals for efficient low and intermediate temperature water electrolysis 43
19.00	Conference Dinner @ Cutlers Hall, Church St, Sheffield, S1 1HG		

International Conference on Carbon Dioxide Utilisation
Thursday 15th September 2016

International Forum
on Sustainable CO₂ Chemical &
Biochemical Utilization
<http://co2forum.cpe.fr>



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presents its 4th edition

**« Large-Volume CO₂ Utilization:
Enabling Technologies for Energy and Resource Efficiency »**

ICCDU-CO₂ Forum Morning session

“Carbon Dioxide Utilization Deployment : an Industrial Reality”

08:15 - 09:00

Registration

09:00 - 09:10

Welcome Address

Alessandra QUADRELLI, CO₂ Forum chairwoman (CPE Lyon –CNRS)
Chunsang SONG, ICCDU (Penn State , EMS Energy Institute)

09:10 - 10:30

**Session 1- Update on ongoing LARGE SCALE
Industrial CDU deployment : part 1 Materials**

Chair **Chunshan SONG**, Penn State , EMS Energy Institute
Moderator **Hans BOLSCHER**, Trinomics

Panelists **Christoph GUERTLER**, Covestro (G) “Markets for Polyurethanes with CO₂”
(pres. 8’ each)
Ah-Hyung (Alissa) PARK, Columbia University (US) “Development of CSS technologies”
Colin HILLS, Carbon8 (UK), “Inorganic Carbonates: aggregates from CO₂ gas

10:30 - 11:00

Coffee break



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11:00 - 12:20

Session 2- Update on ongoing LARGE SCALE Industrial CDU deployment : part 2 fuels and more

Chair **Richard HEYN (Sintef)**
Moderator **Hans BOLSCHER**, Trinomics

Panelists

(pres. 8' each) **Andy BOCARSLY**, Princeton University (US) "From lab electrochemistry to liquid Light®"

Eelco Dekker, Methanol Institute

12:20 - 12:30

Closing of 14th ICCDU
Chairs: Peter STYRING, Sheffield (UK)

12:30 - 14:00

Lunch break

CO₂Chem-CO₂ Forum Afternoon session

"Impacts, Policies And Strategies of CDU"

2:00 - 2:10

Welcome Address

Peter Styring, CO₂ chem network, U. Sheffield
Claude Fussler, CO₂ Forum co-chair, CO₂ Forum vice-chair

2:10 - 2:30

Introductory Addresses

2:30 - 2:45

Scene setting warm-up talk to session 3 : The broader context of CDU
Claude FUSSLER, CO₂ Forum "The broader context of CDU "

2:45 - 3:45

Session 3 – Global Economy and Climate Targets

Chair **Claude FUSSLER**, CO₂ forum vice-chair, Cleantech advisor
Moderator ? **Hans Bolscher** (trinomics)

Panelists

(5' pres) **Bernard DAVID**, The Global CO₂ Initiative "The Big Idea" plan
Juho LIPPONEN iea "Storage and/or utilization?"

Pierre Barthélemy (CEFIC)
(TBC) Henriette NAIMS IASS Potsdam

3:35 - 4:05

Coffee break

4:05 - 4:20

Scene setting warm-up talk to session 4 : Scenarios enabled by CDU massive deployment
Peter Styring, CO₂Chem

4:20 - 5:10

Session 4 : Identified gaps, Policies and Future-looking Strategies



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Chair
Moderator

Katy ARMSTRONG, Sheffield (U.K.)
Hans Bolscher (trinomics)

Panelists
(8' pres)

Dennis Krammer, *Dechema*

Youssef Travaly, *SCOT*

5:10 - 5:30

Closing of 4th CO₂ forum and of the CO₂Chem event

Pete STYRING, Sheffield (UK)

Alessandra Quadrelli (CO₂ Forum)

* as of Jun 20th, 2016

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