

XXIII NATIONAL CATALYSIS CONGRESS

GIC 2023

**Catalysis as a golden lighthouse for green chemistry
and energy related technologies**

SCIENTIFIC PROGRAM

GENOVA

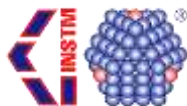
CHIESA DI S. SALVATORE

JUNE 14-16TH 2023

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Wednesday June 14th, 2023

08.00-09.30 Registration

09.30-09.45 Opening Ceremony

09.45-10.30 - Plenary Lecture: José María Fraile Dolado, Fine Chemicals through Heterogeneous (and Supported) Catalysis: beyond recoverability.

10.30-11.00 Coffee break

11.00-13.00 - CO₂ utilization and H₂ production

A. Airi, A. Damin, T. Cordero-Lanza, U. Olsbye, S. Bordiga
MgAPO-18 as key catalyst in the tandem conversion of CO₂

A. Rizzetto, S. Bensaid, R. Pirone, M. Piumetti
Study of ceria-composite materials for high-temperature CO₂ capture and their ruthenium functionalisation for the application in methane production

R. Fiorenza, M.T. Armeli Iapichino, S. Scirè
CO₂ valorization through photothermo-catalytic strategies

C. Coffano, M. Piacentini, A. Porta, C.G. Visconti, F. Rabino, G. Franzoni, B. Picutti, L. Lietti
One-pot lower olefins synthesis from CO₂ hydrogenation

M. Percivale, E. Spennati, P. Riani, R. Millini, G. Garbarino
Nickel- and iron-based catalysts for CO₂/light alkanes pool tandem reactions

A. Pastorino, I. Rizzardi, M. Pagliero, C. Costa, A. Comite
Study on new Ni based catalysts and catalytic membrane reactors in the Methane Dry Reforming and Reverse Water Gas Shift reactions

A. Fasolini, E. Tosi Brandi, F. Basile
PtNi-based catalyst for H₂ production from cellulose aqueous phase reforming

L. Liccardo, G. Colón, A. Vomiero, E. Moretti
Surface defects engineered Nano-Cu/TiO₂ photocatalysts for hydrogen production.

13.00-14.30 Lunch and Poster Session

14.30-15.00 – Keynote lecture: Giulia Licini, Aminotriphenolate Metal Complexes for Sustainable Catalysis.

15.00-16.30 - Heterogeneous catalysts for C1 chemistry

G. Tuci, A. Rossin, L. Truong-Phuoc, C. Pham-Huu, G. Giambastiani

Not another methanation catalyst: depleted uranium meets nickel for a high-performing process under autothermal regime

E. Orfei, A. Fasolini, F. Basile

Ni@Ce_{0.5}Zr_{0.5}O₂ bulk catalysts prepared through a novel surfactant-template method for systems subjected to coke deposition and sintering deactivation in CH₄ reforming processes

R. Calligaro, S. Mauri, M. Boaro, J. Llorca, P. Torelli, A. Trovarelli

Metal-support interaction in methane dry reforming catalysts prepared via dry mechanochemical synthesis

M. Pizzolato, G. Da Pian, A. Di Michele, G. Cruciani, F. Menegazzo, M. Signoretto

Vanadium role in the promotion of Ni/Al₂O₃ catalyst for Methane Dry Reforming

E. Meloni, E. Saraceno, M. Martino, A. Corrado, G. Iervolino, V. Palma

SiC-based structured catalysts for a high-efficiency electrified dry reforming of methane

E. Sartoretti, C. Novara, M. C. Paganini, M. Chiesa, M. Castellino, F. Giorgis, M. Piumetti, S. Bensaid, D. Fino, N. Russo

Involvement of different catalytic sites in CO oxidation over Cu-doped ceria: a comprehensive spectroscopic study

16.30-17.00 Coffee break

17.00-18.30 - Catalysts for industrial chemistry processes

J. Zarupski, A. Piovano, E. Groppo

Highlighting the key elementary step in olefin polymerization catalysis by time-resolved IR spectroscopy of insertion probes

T. Tabanelli, L. Visentin, L. Conte, A. Ventimiglia, M. Berti, N. Scotti, L. Ardemani, N. Dimitratos, F. Cavani

Beyond γ -valerolactone: from levulinic esters to C5 and C7 esters through innovative continuous-flow processes in the gas phase

A. Manna, J. De Maron, T. Tabanelli, C. L. Cruz, P. Righi, F. Cavani

Selective oxidation of substrate with heterogeneous catalysis: an alternative route to key fragrances ingredients

C. Lucarelli, N. Schiaroli, T. Tabanelli, A. Guerrini, S. Billi

Ion exchange resins as selective catalysts for aromatic acylation

F. Taddeo, F. Orabona, R. Tesser, T. Salmi, M. Di Serio, V. Russo

Catalytic screening and kinetic investigation for DPA synthesis

M. Stucchi, S. Hermans, L. Prati

Protecting a Pd/CB catalyst by a mesoporous silica layer for improving activity and selectivity in aldehydes hydrogenation.

18.30 GIC assembly

Thursday June 15th, 2023

08.30-09.00 – Keynote lecture: Giuseppe Bellussi, Methanol, a potential carrier for the energy transition.

09.00-11.00 - Homogeneous and environmental protection catalysts

V. Algieri, C. Algieri, A. Jiritano, P. Costanzo, S. Nesci, L. Maiuolo, A. De Nino

Lewis acid-catalyzed regioselective synthesis of disubstituted 1,2,3-triazoles at biological activity

V. Papa, K. Junge, M. Beller

Hydrogenation of N-heterocycles at very mild conditions: the catalyst design makes the difference

M. Alberti, A. Dariol, A. Caselli

Ammonium zincates as catalysts for the selective coupling of aziridines to yield piperazines

S. Campisi, T. Avola, A. Gervasini

Circular economy practices in environmental catalysis: the case of Sn-hydroxyapatite and its multiple uses

N. Schiaroli, F. Foschi, C. Lucarelli

Guaiacol acylation over a superacid catalyst in mild conditions

F. Liuzzi, C. Cesari, N. Dimitrato, S. Zacchini, S. Albonetti

Supported Pt and Pt/Ni nanoparticles from metal carbonyl clusters as effective catalysts for biobased molecules valorisation

M. Iturrate-Urquijo, E. Spennati, P. Riani, G. Busca, A. Aranzabal, G. Garbarino

Catalytic performance of modified ZSM-5 zeolite for bioethanol conversion

E. Santacesaria

The alternatives of using bioethanol as hydrogen source

11.00-11.30 Coffee break

11.30-13.00- Electrocatalysis for CO₂ to chemicals and H₂ production

M.P. Carpanese

The PROMETH2eus project: from seawater to e-methanol

M. Miceli, C. Genovese, C. Ampelli, G. Centi

Green H₂ beyond electrolysis

F. De Luca, S. Abate, R. Passalacqua, S. Perathoner

Novel possibilities to produce high-value chemicals from CO₂ by electrocatalysis

M. Etzi, J. Dangbegnon, A. Chiodoni, C.F. Pirri

Investigation of the behavior of different Cu-based gas diffusion electrodes for the CO₂ electroreduction in flow cells

G. Tuci, A. Rossin, G. Giambastiani

Metal-free electrocatalysts for the selective 2e⁻ oxygen reduction reaction: a never-ending story?

M. Gallone, E. Fernández-Llamazares, R. Mir, H. Guzmán, M. Díaz de los Bernardos, S. Hernández

Hydroformylation of olefines with CO₂ as CO precursor, an electrochemical-catalytic tandem approach

13.00-14.30 Lunch and poster session

14.30-15.00 – Keynote lecture: Walter Baratta, Ruthenium complexes as efficient catalysts for transfer hydrogenation reactions.

15.00-16.30 - Catalysts preparation, synthesis, and kinetic investigations

A.M. Fiore, M.M. Dell'Anna, P. Mastrorilli

Nickel nanoparticles as highly selective and recyclable catalyst

G. Pampararo, G. Garbarino, P. Riani, G. Busca, D. P. Debecker

Looking for stability: from aerosol Cu/SiO₂ catalysts to bimetallic (Ni,Cu)/SiO₂ for the bioethanol dehydrogenation

A. Vomeri, M. Stucchi, A. Hungría, J. Calvino, L. Prati

Oxidation of cyclohexane to KA oil using noble metal-free Ce and Zr-based mixed oxides

M. Danielis, A. Felli, N. Fonda, S. Colussi, A. Trovarelli

Effect of milling parameters on the chemistry, morphology, and CO oxidation activity of CeO₂ powders

M. E. Fortunato, F. Taddeo, R. Vitiella, R. Turco, R. Tesser, V. Russo, M. Di Serio

Heterogeneously catalyzed esterification of oleic acid with trimethylolpropane: a kinetic investigation

F. Orsini, D. Ferrero, S. Cannone, M. Santarelli, A. Felli, A. Strazzolini, M. Boaro, C. de Leitenburg, A. Trovarelli, J. Liorca

The impact of exsolution on chemical looping applications of Sr₂FeMo_{0.6}Ni_{0.4}O_{6-δ}

16.30-17.00 Coffee Break

17.00-18.30 - Thermo-, Photo- and Electrocatalysts for CO₂ utilization and H₂ production

G. Forghieri, I. Martin, S. Mauri, P. Torelli, M. Signoretto

Cu-doped perovskites for the photo-reduction of CO₂

M. Voccia, F. Silveri, A. Salanitro, S. C. Zignani, S. A. Aricò, D. Pullini, M. F. Sgroi

Reaction mechanisms of methanol vs. ethanol synthesis on Cu-based materials

M. P. Mezzapesa, F. Salomone, F. Zammillo, H. Guzman, R. Millini, L. Bua, G. Marra, A. Tacca, R. Marrazzo, N. Russo, R. Pirone, S. Hernández, S. Bensaid

In-Cu binary oxides catalyst for CO₂ hydrogenation

M.T. Armeli Lapichino, S.A. Balsamo, R. Fiorenza, S. Scire`

Unconventional photocatalysts for the H₂ production by solar photoreforming

E. Tosi Brandi, E. Orfei, A. Fasolini, N. Sangiorgi, A. Sangiorgi, A. Sanson, F. Basile

Layered Double Hydroxides based photo-electrocatalysts for CO₂ conversion into solar fuels and chemicals

P. Vedele, E. Sartoretti, F. Salomone, M. Antonini, S. Bensaid

Thermocatalytic pyrolysis of methane over Fe/Al₂O₃ catalysts for hydrogen production

20.00 Cocktail and Social Dinner at Genova Aquarium

Friday June 16th, 2023

08.45-09.30 - Plenary Lecture: Gregory Stephanopoulos, Can biotechnology deliver cost effective liquid fuels from renewable feedstocks?

09.30 -10.10 GIC and poster Awards

09.30-09.45 Grasselli Award Winner

Filippo Bossola

Steam reforming reactions for the sustainable hydrogen production from biomass-derived raw materials

09.45-10.00 Grasselli Award Winner

Jacopo De Maron

Gas-phase partial oxidation of fatty alcohols over $\text{CuO}_x/\gamma\text{-Fe}_2\text{O}_3$: a noble-metal free catalyst for the synthesis of perfume ingredients

10.00-10.10 Poster Awards

10.10-11.10 - Catalysts for environmental protection and remediation

F. Trifirò

New catalysts to eliminate HCN

J.A. Martín-Martín, M.P. González-Marcos, A. Aranzabal, J.R. González-Velasco

Effect of NO reduction on o-DCB oxidation

S. Econdi, M. Guidotti, R. Soave, A. Caselli, S. Tomaselli, L. Ragona, D. Mileto, M. Cutrera, M. Bianchi

Catalytic oxidative degradation of highly hazardous chemical and biological contaminants over sulfonic acid ion-exchange resins

G. Iervolino, V. Vaiano, V. Palma

Non Thermal Plasma Catalysis for Water Treatment

11.10-11.40 Coffee Break

11.40-13.00 - Spectroscopy in catalysis

S. Rojas-Buzo, E. Braciotti, A. Jouve, D. Salusso, F. Bonino, V. Crocellà, M. Signorile, S. Bordiga

DMC synthesis from CO_2 over MOF and MOF-derived Ce and Ce/Zr oxides

C. Pontremoli, K. Hall, M. Bonomo, N. Barbero, C. Barolo, M. Sørli, V. Eijsink, S. Bordiga

LPMO immobilization on carbon nanotubes: a first investigation toward higher stability and catalytic activity

M. Signorile, V. Finellia, B. Centrella, G. Deplano, B. Garetto, E. Aunan, M. Bonomo, E. Borfecchia, C. Barolo, P. Szilagy, U. Olsbye, S. Bordiga

Cu-MOFs as potential oxygenation catalysts: redox performances from a XAS study

G. Di Liberto, I. Barlocco, G. Pacchioni

Role of hydrogen and oxygen complexes in water splitting reaction on single-atom catalysts

E. Vottero, R. Pellegrini, A. Piovano, E. Groppo

Types and amount of functional groups in activated carbons used in catalysis

13.00-14.20 Lunch

14.20-14.50 – Keynote: Gian Luca Chiarello, Modulated Excitation Spectroscopy: A Powerful Tool to Study Catalytic Mechanism of Reaction.

14.50-15.50 - Pyrolysis and carbon-based catalysts

M. Borella, M.A. Palazzolo, H.H. van de Bovenkamp, P.J. Deuss , A.A. Casazza, G. Garbarino, G. Busca

Pyrolysis and hydrotreatment of Kraft Lignin: catalytic hydrodeoxygenation of pyrolytic oil

C. Antonetti, D. Licursi, B. Bertini, L. Ardemani, N. Scotti, N. Di Fidio, S. Fulignati, A.M. Raspolli Galletti

Sustainable synthesis of biomass-derived catalysts: hydrochars and pyrochars in the perspective of acid applications

F. Menegazzo, L. Longo, S. Taghavi, E. Ghedini, A. Di Michele, M. Signoretto

Development of biochars as supports of new catalysts for the future biorefinery

S. Atakoohi, E. Spennati, P. Riani, G. Garbarino

Design and assessment of Ni- and Ru- supported catalysts for CO₂ methanation

15.50-16.10 Closing remarks

Posters

- 1 N. Di Nicola, M. Crucianelli, A. Lazzarini
MOF-based Materials for Electrocatalytic Water Splitting Reaction
- 2 S. Taghavi, G. Forghieri, E. Ghedini, M. Signoretto
Perovskite as novel photocatalytic material for CO₂ utilization
- 3 R. Balzarotti, C. Cristiani, G. Garbarino, E. Spennati, J. Basbus, A. Lagazzo, E. Finocchio
Fe-Ceria catalyst for Volatile Organic Compounds oxidation
- 4 M. Offidani, T. Tabanelli, L. Giorgini, T. Benelli, M. Nodari, M. Melloni, A. Ferrando, F. Cavani
In-situ and ex-situ thermocatalytic pyrolysis of plastics: a comparison of two different approaches
- 5 D. Allkanjari, J. De Maron, D. Cesari, T. Tabanelli, A. Fasolini, F. Basile, F. Cavani
An innovative catalytic pathway for the synthesis of acyl furans: the cross-ketonization of methyl 2-furoate with carboxylic acids
- 6 M. Bertj, T. Tabanelli, G. Galletti, A. Manna, D. Allkanjari, F. Cavani
Sustainable synthesis of dimethyl adipate from cyclopentanone and dimethyl carbonate
- 7 M.J. San José, S. Alvarez, R. López
Catalytic combustion of waste biomass from wood-processing industry in a conical spouted bed combustor
- 8 G. Da Pian, E. Ghedini, A. Di Michele, F. Menegazzo, G. Cruciani, M. Signoretto
CO₂ methanation: role of V, Co and Fe over Ni/Al₂O₃ catalysts
- 9 G. Conte, A. Marino, R. Colaiezzi, A. Lazzarini, C. Poselle Bonaventura, R.G. Agostino, M. Crucianelli, A. Aloise, A. Policicchio
Toward boronated biomass-derived carbons as hydrogen storage systems
- 10 G. Sportelli, G. Grando, G. Filippini, M. Melchionna, P. Fornasiero, M. Prato
Carbon nitrides for α -oxidation of N,N-functionalized anilines
- 11 M. Belluati, S. Tabasso, E. Calcio Gaudino, W. Bonrath, J. Medlock, M-A. Müller, G. Cravotto, M. Manzoli
Microwave-assisted selective alkyne semi-hydrogenation over commercial gold catalysts
- 12 C. Cocuzza, E. Sartoretti, C. Novara, F. Giorgis, S. Bensaid, N. Russo, D. Fino, M. Piumetti
Catalysts for the total conversion of VOCs: Mn-Cu oxides prepared by Solution Combustion Method
- 13 E. Corrao, F. Salomone, E. Giglio, M. Castellino, R. Pirone, S. Bensaid
Synthesis and characterization of multifunctional Fe-based catalysts for efficient hydrogenation of CO₂ to hydrocarbons
- 14 R. Turco, R. Vitiello, R. Tesser, M. Di Serio, V. Russo
Heterogeneous catalysts for the ketalization of ethyl levulinate with glycerol
- 15 R. Tesser, M. E. Fortunato, F. Taddeo, M. Di Serio, V. Russo
Synthesis of methyl-levulinate catalyzed by an ion-exchange resin: a kinetic investigation

- 16 R. Freccero, E. Spennati, P. Riani, G. Garbarino
Ni-containing intermetallic catalyst precursors for CO₂ hydrogenation
- 17 M. Bigica, S. Campisi, G. Ghiara, P. Cristiani, A. Gervasini
On the role of hydroxyapatite as a key component in cathode materials to drive the electroreduction of CO₂ to CH₄
- 18 N.K. Varghese, M. Boccia, V. Marzocchi, M. Pagliero, A. Comite
A study on the catalytic decomposition of hydrogen peroxide on NiFe/CeO₂ catalysts
- 19 G. Pipitone, R. Pirone, S. Bensaid
Catalytic valorization of cheese whey through renewable hydrogen production
- 20 E. Spennati, A. Fasolini, G. Busca, F. Basile, G. Garbarino
Hydrotalcite-derived Ni/Mg(Al)O mixed oxides for CO₂ methanation: performances, surface studies and kinetic development
- 21 M. Notari, G. Eranio, A. Giugno, F. Magrassi
Creating and scaling nano-enabled Bio-based Materials for a Circular economy; the BIOMAC Project experience
- 22 L. Ardemani, N. Scotti, N. Ravasio, F. Zaccheria
Hydrocyclization of levulinic esters to γ -valerolactone using ZrO₂-based catalysts via catalytic transfer hydrogenation
- 23 D. Cademartori, M. Hubert, A. Yazdani, A. Nilawar, J. Laurencin, M. P. Carpanese
Artificial Impregnation of a freeze tape cast YSZ scaffold for Solid Oxide Cells (SOCs): electrode design optimization
- 24 A. Giordana, G. Cerrato, V. Bortolotto, R. Djellabi, A. Di Michele, L. Operti, C.L. Bianchi
Ag₃PO₄/Fe₃O₄ for photocatalytic removal of water pollutants
- 25 R. Vitiello, R. Turco, R. Tesser, M. Di Serio, V. Russo
Synthesis of biosurfactants from ketals of ethyl levulinate
- 26 O. Tammaro, M. Chianese, M. Hmoudah, R. Tesser, M. Fontana, B. Masenelli, V. Russo, M. Di Serio, S. Esposito
An effective synthesis route for efficient UV/VIS photocatalysts: Fe-CeO₂ NPs for Ibuprofen degradation
- 27 N. Morante, A. Mancuso, D. Sannino, V. Vaiano, L. De Guglielmo, N. Femia, G. Di Capua
Visible Light driven degradation of ceftriaxone by light modulation techniques
- 28 L. Chianese, G. Iervolino, R. Viscardi, C. Bassano, V. Vaiano, V. Palma
Catalysts for the conversion of CO₂ to methanol
- 29 O. Muccioli, E. Meloni, S. Renda, V. Palma
Microwave-assisted catalytic dehydrogenation of propane to propylene

- 30 E. Saraceno, V. Palma, E. Meloni, C. Ruocco, M. Martino, A. Giaconia
Study on the catalytic hydrogasification reaction of carbonaceous materials into methane-rich stream in a fixed bed reactor
- 31 G. Iervolino, V. Vaiano
UV-assisted photocatalysis for simultaneous valorization and treatment of olive mill wastewater
- 32 E. Meloni, L. Cafiero, C. Esposito, S. Renda, M. Martino, M. Pierro, V. Palma
Ru- and Rh- based catalysts for CO₂ methanation assisted by non-thermal plasma
- 33 A. Tauro, F. Salomone, E. Giglio, S. Bensaid, R. Pirone
Modelling of cyclic CO₂ adsorption and in situ methanation over dual function materials: a parametric study
- 34 V. Palma and C. Ruocco
On the stability of structured foam catalysts for bioethanol reforming