

# CURRICULUM VITAE

## Professor Angelos M. Efstathiou

### Chemistry Department, University of Cyprus

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### Personal

Born: November 5, 1956; Morphou, Cyprus  
Married, six children

Citizenship: Greek-Cypriot

### Education

#### PhD in Chemical Engineering (1989)

University of Connecticut, USA; GPA: 3.95/4.0

Thesis Title: "Transient and Isotopic Tracing Kinetic Study of Supported Rhodium Catalysts in the CO Hydrogenation Reaction" (Professor C. O. Bennett).

#### MSc in Chemical Engineering (1985)

University of Connecticut, USA; GPA: 3.7/4.0

#### BSc (Diploma) in Chemical Engineering (1981)

National Technical University of Athens (Ethnikon Metsovion Polytechnion), Greece; GPA: 8.0/10.0

### Employment

#### Professor of Chemistry

Department of Chemistry, University of Cyprus, Nicosia, Cyprus, 7/2008 - present

#### Associate Professor of Chemistry

Department of Chemistry, University of Cyprus, Nicosia, Cyprus, 7/2002 – 6/2008

#### Assistant Professor of Chemistry

Department of Natural Sciences, and Department of Chemistry, University of Cyprus, Nicosia, Cyprus, 1/1997 – 6/2002

#### Assistant Research Professor

Institute of Chemical Engineering and High Temperature Chemical Processes (ICE/HT-FORTH), Patras, Greece, 11/1994 – 12/1996

#### Senior Research Scientist

Institute of Chemical Engineering and High Temperature Chemical Processes (ICE/HT-FORTH), Patras, Greece, 8/1991 – 11/1994

#### Post-Doctoral Fellow

Department of Chemistry, University of Connecticut, USA, 2/1989 – 6/1991

Subject: Cyclopropane and Hydrogen Reactions in Zeolites Studied by Transient Techniques (Prof. Steven L. Suib)

## **Administrative Responsibilities – University of Cyprus**

Elected Member of the Senate of the University of Cyprus, 1999-2001

Vice-Dean, School of Pure and Applied Sciences, 2011-2014

Head, Department of Chemistry, 7/2004 – 3/2006

Deputy Head, Department of Chemistry, 11/2002 – 7/2004

Member of Council, School of Pure and Applied Sciences, 7/2004 – 3/2006; 2/2022 – 2/2024

Appointed Chairman of Senate's Committee "University student conduct disciplinary rules", 2001-2003; 2003-2006

Appointed Member of Senate's "Research Committee", 2010-2011; 9/2022- 8/2024

Appointed Member of Senate's Committee "Improvement of university policy regarding patent applications", 2010 – 2018

Appointed Member of Senate's Ad-hoc Committee "Establishment of rules governing the participation of faculty members in mechanisms for the conversion of scientific knowledge into marketable products and services", 2001-2002; 2006-2008

Member of the Committee for preparing Entrance Examinations (Chemistry subject) in the Greek Universities and the University of Cyprus, 1999

Chairman and Member of several Specialist Committees for the hiring and promotion of Chemistry faculty, 2008 - 2024

Departmental Co-ordinator of ERASMUS European Program, 2008-2009

Coordinator of the Undergraduate Program, Department of Chemistry, 2001-2003

Coordinator of the Graduate Program, Department of Chemistry, 1999-2000

Coordinator of the Chemistry Graduate Program, Department of Natural Sciences, 1998-1999

Coordinator of Graduate Seminars, Chemistry Section, Department of Natural Sciences, 1996-1997.

## **Administrative Responsibilities – Other**

Member and Co-ordinator of External Evaluation Committees, assessment of Chemistry and Environmental Engineering/Science Departments (Hellenic Quality Assurance Agency; 10 academic departments), 2010 -2014

Appointed Board Member of the "Center for Catalysis and Separations - CeCaS", Khalifa University, Abu Dhabi (United Arab Emirates), 5/2019 - present

Appointed Member of the "National Bioethics Committee of Cyprus", 2005-2010

Member of the European Federation of Catalysis Societies (EFCATS), 2011- 2023; elected representative of the Hellenic Catalysis Society (Greece)

Appointed Scientific Board Member of the "Center of Applied Research and Technology" - University of Nicosia, 2007-2010

Appointed National Representative (Cyprus Research Promotion Foundation) - COST Domain Committee (European Union): Chemistry and Molecular Sciences and Technologies, 2007-2010; 2011-2014

Appointed Member of the National Foundation for Fellowship Awards, 2001-2003; 2004-2006; 2007-2010

Member of Specialist Committees for the evaluation of Research Grant Applications - Cyprus Business Incubators and Technological Parks, 2015-2017

Member of Specialist Committees for the promotion of faculty members in private Cypriot Universities, 2012

## Teaching

January 1997-present: Department of Natural Sciences (Chemistry Section), and Department of Chemistry, University of Cyprus

Courses: Heterogeneous Catalysis - 4<sup>th</sup> year undergraduate; Chemical Technology I - 3<sup>rd</sup> year undergraduate; Chemical Technology II - 4<sup>th</sup> year undergraduate; Chemical Technology Laboratory - 4<sup>th</sup> year undergraduate; Special Topics-Research Techniques for the Study of Catalytic Reaction Mechanisms - postgraduate; Advanced Topics in Heterogeneous Catalysis - postgraduate.

*Note:* Four monographs available in electronic form related to Chemical Technology I (175 pages), Chemical Technology II (170 pages), Chemical Technology Lab (180 pages) and Heterogeneous Catalysis (205 pages) were written.

## Research Statement

We are targeting the development of novel *metal oxides and their supported metal counterparts' solid materials* for use in existing or new environmental and energy related industrial catalytic processes.

Chemical compounds using *alternative greener catalytic routes* than existing ones (e.g., olefins from syngas than thermal/catalytic cracking of naphtha) is an additional target on how our work can add value. In pursuing this goal, wet chemistry synthetic routes easily adopted by industrial catalysis practice, e.g. wet impregnation with controlled pH, sol-gel methods, co-precipitation and hydrothermal methods are being sought. The surface structure of the solid catalytic material *before reaction* can be tuned based on the drying and thermal gas treatments applied on the synthesized materials (fresh catalysts). Since the *surface structure* of the solid catalyst and its *electronic properties vary under reaction conditions*, it is essential that an effective design of an *active, selective, and stable* catalytic surface should seek accurate information about *relationships* between the *structure of surface-active catalytic sites* and *chemical composition of the active adsorbed reaction intermediates* and *catalyst's performance*. Such information is obtained only by the rigorous use of *in situ kinetic and spectroscopic techniques* coupled with the use of *stable isotopes* applied under dynamic conditions - *transient methods*. These dynamic methods, described below, coupled with *microkinetic modelling* allow the rigorous investigation of *mechanisms of heterogeneous (gas/solid) catalytic reactions*, largely contributing to the advancement of catalyst's design.

### ***In situ catalyst surface characterization techniques***

Temperature-Programmed Desorption (TPD); Temperature-Programmed Reduction (TPR) and Surface Reaction (TPSR); Transient isothermal titration methods for the *in situ* characterization of adsorbed surface intermediate species; In situ Diffuse Reflectance Infra-Red Fourier Transform Spectroscopy (DRIFTS) for the characterization of the chemical structure of adsorbed reaction intermediate species; Transient Isotopic Techniques; X-ray Photoelectron Spectroscopy (XPS); In situ Raman Spectroscopy; In situ UV-vis/DRS.

### ***Investigation of mechanisms and kinetics of heterogeneous catalytic reactions – Transient Method***

An extensive use of the *Steady State Isotopic Transient Kinetic Analysis* (SSITKA) technique coupled with *online Mass Spectrometry* and *DRIFTS (Operando Methodology)*; Design of experimental protocols comprising the sequence of appropriate step gas-switches in the reaction feed gas composition at constant temperature; Design of experimental protocols combining both the step-gas switch in the feed gas composition and the temperature-programming of the catalyst.

### ***Investigation of relationships between surface physico-chemical and catalytic properties***

In situ measurements of solid surface acidity/basicity (TPD-MS, TPD-DRIFTS); In situ DRIFTS, XPS, Raman and UV-vis/DRS coupled with catalytic performance measurements, ca. activity, selectivity, and stability with time on stream (*Operando Methodology*).

### ***Environmental catalytic chemistry***

Development of NO<sub>x</sub>, CO and H<sub>2</sub>S de-pollution control catalytic technologies for stationary and mobile applications. A novel H<sub>2</sub>-SCR (H<sub>2</sub>/NO<sub>x</sub>/O<sub>2</sub> → N<sub>2</sub>/H<sub>2</sub>O) catalytic system has been developed for which several patents have been obtained. A “License Agreement” with Linde Engineering AG (Germany) for the exploitation of the patents and commercialization of the H<sub>2</sub>-SCR technology was signed (2008-2010).

### ***Heterogeneous catalytic chemistry for energy and chemicals production***

Natural Gas upgrading into useful chemicals (e.g., H<sub>2</sub>, CO/H<sub>2</sub>, hydrocarbons, olefins, alcohols) via *Fischer-Tropsch Synthesis* over Co- and Fe-based catalytic materials.

Dry Reforming of Methane (CH<sub>4</sub>/CO<sub>2</sub> → CO/H<sub>2</sub> gas) over doped CeO<sub>2</sub>-based supported metals.

CO<sub>2</sub> hydrogenation to CH<sub>4</sub>, CH<sub>3</sub>OH and low-carbon olefins reaction processes.

Steam Reforming of non-recyclable organic solvents towards H<sub>2</sub> production.

Conversion of biomass pyrolysis-derived products to a hydrogen-rich gas stream.

### **Research Collaboration with Industry**

SASOL Technology SA (South Africa), 7/2013 - 9/2026

“Fischer-Tropsch Synthesis, and CO<sub>2</sub> Hydrogenation towards Olefins on Fe- and Co-based Industrial Catalysts”

Luxfer MEL Technologies, Manchester, England, 2006 – 2008; 2013 – 2018

“Characterization of the Oxygen Storage and Release Properties of Ceria/Zirconia-based Materials via Transient <sup>18</sup>O<sub>2</sub> Isotopic Methods”

Linde Engineering AG, Munich, Germany, 2006-2010

“Commercialization of Patent Titled “Catalyst for the Reduction of NO to N<sub>2</sub> with Hydrogen Under NO<sub>x</sub> Oxidation Conditions”

CERECO, Chalkida-Greece, 2004 – 2010

“Development of Monolithic Pt/MgO-CeO<sub>2</sub> Catalyst for H<sub>2</sub>-SCR of NO<sub>x</sub> for Industrial Applications”

### **Research Awards and Honors**

*World's Top 2%* scientist in the *Chemistry* field and *Physical Chemistry* sub-field (career-wise) for the years 2020, 2021, 2022 and 2023 (*Top 1.3%*). Also, in the list “World's Top 2%” based only on the year 2021, 2022 and 2023; published by Stanford University (J.P.A. Ioannidis et al., “Updated science-wide author databases of standardized citation indicators”).

**Eminent Visitor Award - 2019**, Catalysis Society of South Africa (CATSA)

“In recognition of his contributions to heterogeneous catalysis, in particular the elucidation of reaction mechanisms through transient techniques”. This award is given annually by the Catalysis Society of South Africa (CATSA) to recognize excellence in catalysis research by overseas scientists and their significant contributions.

**Royal Award for Sustainable Technology Transfer – 2008**, European Environment Agency

“For successfully transferring technology that improves operational performance, productivity and efficiency, while reducing costs and mitigating greenhouse gas emissions in the frame of Novel Selective Catalytic Reduction of NO<sub>x</sub> Using Hydrogen in Strongly Oxidizing Conditions at Low-Temperature for Stationary NO<sub>x</sub> Control”; The highest distinction received by the University of Cyprus in the area of Technology Transfer from Universities to the Industry.

**Research Award Nikos Symeonides – 2007**, Cyprus Research Promotion Foundation

“Acknowledgement and reward for the excellent performance in research related to the improvement of the quality of life in Cyprus and Europe” (12 Applicants). Project Title: Development of a Novel de-NO<sub>x</sub> Catalytic Technology (H<sub>2</sub>-SCR); Plaudit, Prize and 5,000 Euros. This award was established for the first time in 2007.

**Research Award – 2016**, Cyprus Research Promotion Foundation

“For his successful participation in the 5<sup>th</sup> FP of European Union – Technological development and demonstration”. Project Title: Improvement of Ceramic Substrate of Three-Way Catalysts to Develop a Regeneration and/or Reactivation with Procedure of Used Catalysts”.

**Young Scientists Award – 2001**, European Federation of Catalysis Societies (EFCATS)

“Acknowledgment for the best research project undertaken by Young European Scientists”. Project Title: A Highly Active and Selective Pt/Support Catalyst for the NO/H<sub>2</sub>/O<sub>2</sub> (Lean de-NO<sub>x</sub>) Reaction (see CATTECH 5(2), 116-118 (2001); Appl. Catal. A: 214, N3 (2001)).

**Best Poster Award – 2019**, 14<sup>th</sup> European Congress in Catalysis (EuropaCat-14)

M.A. Vasiliades, C.M. Damaskinos, K.K. Kyrianiou, A.M. Efstathiou, "The effect of Pt and dopant M (Pr<sup>3+</sup>, Ti<sup>4+</sup>) in the Ce<sub>1-x</sub>M<sub>x</sub>O<sub>2-δ</sub>-supported NiPt catalyst on the carbon pathways in the Dry Reforming of Methane (DRM) studied by transient and isotopic techniques”.

**Best Poster Award – 2017**, 13<sup>th</sup> European Congress in Catalysis (EuropaCat-13)

M.A. Vasiliades, K.C. Petalidou, A.M. Efstathiou, "The effect of Co particle size and time on stream on the deactivation of Co/γ-Al<sub>2</sub>O<sub>3</sub> in CO hydrogenation studied by SSITKA and DRIFTS techniques”.

**Best Oral Presentation Award – 2007**, III International Conference, “Catalysis: Fundamentals and Application”, Novosibirsk, Russia.

P.G. Savva, C.N. Costa, A.M. Efstathiou, “The mechanism of reduction of NO with H<sub>2</sub> in strongly oxidizing conditions (H<sub>2</sub>-SCR) on a novel Pt/MgO-CeO<sub>2</sub> catalyst: Effects of reaction temperature”

**Honor Diploma - 2006**, Cyprus Research Promotion Foundation

“Acknowledgement for the successful participation in three (3) European Projects within 5<sup>th</sup> FP with a total budget of 570,000 Euros”.

**Honor Diploma - 2006**, Hellenic Catalysis Society

“Acknowledgement for significant contributions to the promotion of knowledge in the field of Environmental Catalysis”, 9<sup>th</sup> Panhellenic Catalysis Symposium, 6-7 October 2006, Lefkada-Greece.

**Honor Environmental Engineering Award – 2009**, Federation of Cyprus Environmentalists and Ecologists, “Acknowledgement for significant contributions to the protection of environment”.**Second Award – Best Undergraduate Student Research Project - 2006**, Cyprus Research Promotion Foundation - Program “ΠΡΟΦΟΙΤ”

Christos Kalamaras, Diploma Thesis: “Mechanistic studies of the Water-Gas Shift reaction over Pt, Rh, and Pd-supported catalysts” (4.500 Euros Award).

**Best Poster Award - 2004**, 1<sup>st</sup> International Conference on Carbon in Catalysis (CarboCat-1)

P.G. Savva, C.N. Costa, V.A. Ryzhkov, A.M. Efstathiou, “Hydrogen production by ethylene decomposition over Ni supported on novel carbon nanotubes and carbon nanofibers”.

**Editorships****Editor**

*Catalysis Communications* (Elsevier, 5-year avg. Impact Factor = 3.6), 6/2016 – 3/2023

**Guest Editor**

*Catalysis Communications*, Special Issue “Non-noble metal catalysts for electrocatalytic hydrogen evolution reaction” (Catal. Commun. 169 (2022) 106465).

*Catalysis Communications*, Special Issue “Isotopic labelling investigations for catalyst design” (in preparation, 2023).

*Catalysis Today*, “Fuel roadmap for the mid-21<sup>st</sup> century: Advanced catalytic processes and strategies for the production and use of energy and fuels”, *Catalysis Today* 242 (2015) 1-239.

*Catalysts*, "Advancements in Environmental Catalysis - The 19th National Congress on Catalysis of China", *Catalysts*, vol 10 (2020).

## Editorial Board Membership

Applied Catalysis B: Environmental, 2012- today

Frontiers in Environmental Chemistry, 2015 – 2019

The Scientific World Journal, Hindawi Publishing Corporation, 2012 – 2018

## Reviewer - Scientific Papers

1990 – today (*more than 1000 papers*)

Nature Communications

Journal of the American Chemical Society (JACS)

Journal of Catalysis

Langmuir (ACS)

Chemistry of Materials (ACS)

Energy & Fuels (ACS)

Green Chemistry (RSC)

Catalysis Science & Technology (RSC)

Topics in Catalysis

Catalysis Letters

Catalysis Communications

Applied Surface Science

Energy and Environmental Science (RSC)

Materials Chemistry and Physics

Surface & Interface Analysis

Journal of CO<sub>2</sub> Utilization

Fuel Processing Technology

J. Environmental Chemical Engineering

Fullerenes

The Canadian Journal of Chemical Engineering

Chemical Engineering Journal

The Scientific World Journal

Angewandte Chemie Int. Ed.

Applied Catalysis B: Environmental

Applied Catalysis A: General

J. of Physical Chemistry B & C (ACS)

Ind. & Eng. Chemistry Research (ACS)

Env. Science & Technology (ACS)

Phys. Chem. Chem. Phys. (RSC)

RSC Advances

Catalysis Today

Journal of Mol. Catalysis A: Chemical

React. Kinet. Mech. Catal.

Applied Spectroscopy

Journal of Sol-Gel Sci Technology

Microporous and Mesoporous Materials

Int. Journal of Hydrogen Energy

Journal of Environmental Sciences

Environmental Engineering Science

Chemical Engineering Science

Nanotubes and Carbon Nanostructures

Chemical Engineering Communications

Journal of Hazardous Materials

Biomass Conversion and Biorefinery

## Expert Evaluator - Research Grants

Hellenic Foundation for Research and Innovation (H.F.R.I) - Basic Research Financing (Call, Sub-action 2 - Funding Projects in Leading Edge Sectors), 2023

King Abdullah University of Science and Technology (KAUST), Office of Sponsored Research, Program: Competitive Research Grants (CRG), Saudi Arabia, 2021

The National Centre for Research and Development (NCRD), Poland, Program “Applied Research-Small Grant Scheme”, 2020

Academy of Finland, Early-Career Researchers Program, 2018-2019

M-ERA.NET Call 2017, Karlsruhe Institute of Technology (KIT), 2017

Hellenic Foundation for Research & Innovation (Greece), Program: “Support of Faculty Members and Researchers”, 2016

National Centre for Research and Development, Polish-Norwegian Research Program, 2013

COST (European Union), Domain: Chemistry and Molecular Sciences and Technologies, Cyprus, 2009-2013

ANR – France, Program BLANC, Project: “Simultaneous elimination of NO<sub>x</sub> and N<sub>2</sub>O from stationary sources using heterogeneous catalysis: Molecular Approach of Catalyst Design”, 2008

Program of Establishment of New Ventures of High Technology and Innovation Through Business Incubators, Ministry of Commerce, Industry and Tourism (Cyprus), 2009-2011

Expert Evaluator, 7<sup>th</sup> FP European Union, 2011-2013



Expert Evaluator of Greek Research Programs: “Archimedes III”, “Thales”, “Innovation Actions”, “States Scholarships-PhD”, Ministry of Education, Lifelong Learning, and Religious Affairs, Greece, 2010-2012

Research Committee of the University of Patras-Greece, Program: Kartatheodoris - “Fundamental Research”, 2008

Petroleum Research Fund (American Chemical Society) – California State University, Project Title: “Chemistry of Ag/Al<sub>2</sub>O<sub>3</sub> catalyzed de-NO<sub>x</sub> reactions”, 2006.

## Research Funding

### A. National and International

1. Restart 2016-2020 Program (Cyprus Research Promotion Foundation) - New Strategic Infrastructure Units – Young Scientists, Project: “Nanoparticle/Nanomaterial Synthesis and Characterization Laboratory”, 2/2018 – 6/2023; *Contractor Partner*, 85.200 €
2. Khalifa University of Science & Technology – Competitive Internal Research Award (CIRA), Project: “From Waste to Bio-refinery: Renewable Transportation Fuels From Bio-oil Catalytic Upgrading”, 6/2019 – 6/2022; *Contractor Partner*, 34.000 €
3. Hellenic Foundation for Research and Innovation, Science & Technology, Project: “Mechanistic Aspects of VOC Oxidation over Metal Oxide Catalysts”, 6/2022-6/2023 *Contractor Partner*, 28.500 €
4. European Union, HORIZON 2020 – Marie Skłodowska-Curie Individual Fellowships-Global Fellowships (MSCA-IF-GF), “The effect of water on the mechanism and kinetics of Fischer-Tropsch reaction over bimetallic Co-based catalysts: theoretical and experimental studies” 4/2017 – 3/2020; *Research Coordinator*, 260.000 €
5. Cyprus Research Promotion Foundation, Program ΘΕΠΠΣ/0311/BE/31 “Development of New Advanced Ce-Zr-O-Based Materials for Automotive Catalytic Pollution Control Applications” 7/2012 – 6/2015; *Research Coordinator*, 140.000 €
6. Cyprus Research Promotion Foundation, Program ANABAΘΜΙΣΗ/ΠΑΓΙΟ/0308 “Establishment of the Infrastructure for Time-Resolved Step-Scan Fourier Transform Infrared Spectroscopy”, 1/2008 – 12/2013; *Contractor Partner*, 50.000 €
7. Cyprus Research Promotion Foundation, Program ΤΕΧΝΟΛΟΓΙΑ/ΥΛΙΚΑ/0308(BE), “Chameleon-like Adoptive Nanocomposite Catalytic Materials for the Optimization of Low-Temperature Water-Gas Shift Reaction (LT-WGS)”, 3/2009 – 5/2012; *Research Coordinator*, 120.000 €
8. Cyprus Research Promotion Foundation, Program ΜΗΧΑΝ/0308 “Development and Demonstration of a Novel Technology for an Integrated After Treatment Of Ship Flue Gas Streams”, 1/2009 – 12/2010; *Contractor Partner*, 40.000 €
9. Cyprus Research Promotion Foundation, Program ΔΙΑΚΤΩΡ/ΔΙΣΕΚ/0308 “Development of a Novel Method for the Elongation of Life Time of Deactivated Three-Way Catalytic Converter”, 12/2008 – 1/2012; *Research Coordinator*, 135.000 €
10. Cyprus Research Promotion Foundation, Program ΠΕΝΕΚ/ΕΝΙΣΧ/0308 “Synthesis of Novel Catalytic Materials for Low-Temperature WGS Reaction”, 1/2009 – 12/2010; *Research Coordinator*, 60.000 €
11. Cyprus Research Promotion Foundation, Program ΠΕΝΕΚ/ΕΝΙΣΧ/0308 “Development and Studies of New Materials towards Tar Steam Reforming for Hydrogen Production”, 1/2009 – 6/2010; *Research Coordinator*, 45.000 €
12. Cyprus Research Promotion Foundation, ΔΙΑΚΡΑΤΙΚΕΣ/CY-ROU/0609, “Development of New Materials for Low-Temperature Industrial NO<sub>x</sub> Control Catalytic Technology Applications Using H<sub>2</sub>/CO and H<sub>2</sub>/HC Gas Mixtures as Reducing Agents”, 2011-2012; *Research Coordinator*, 18,000 €

13. European Union, 6<sup>th</sup> Framework Program, INTERREG III B ARCHIMED Program, “Mobile Laboratory for Environmental Pollution Measurements and Emission Control Systems Evaluation”, 6/2006- 6/2009; *Contractor Partner*, 205.000 €
14. Cyprus Research Promotion Foundation, Program EPYAN/0205, “Development of a Molecular Spectroscopy Laboratory”, 1/2006 – 12/2009; *Contractor Partner*, 35.000 €
15. Cyprus Research Promotion Foundation, Program KY-EΛ/0406, “Hydrogen Production via Catalytic Steam Reforming of Bio-Oil Derived from Biomass Gasification”, 1/2007 – 12/2009; *Research Coordinator*, 18.000 €
16. Cyprus Research Promotion Foundation, Program KY-POY/0407, “Processing of Biomass Gasification”, 3/2008 – 2/2010; *Research Coordinator*, 18.600 €
17. Cyprus Research Promotion Foundation, Program: ENIEX/0506, “Experimental and Theoretical Mechanistic Studies of the Water Gas-Shift Reaction”, 12/2006- 11/2009; *Research Coordinator*, 105.000 €
18. European Union, 6<sup>th</sup> Framework Program, Energy, Environment and Sustainable Development, RTD Project, “Biomass Fluidised Bed Gasification with *in-situ* Hot Gas Cleaning” 1/2006- 6/2009; *Contractor Partner*, 260.000 €
19. University of Cyprus, “An in-depth Investigation of Catalytic Applications of Novel Carbon Nanotube-Supported Metal Catalysts: The Case of H<sub>2</sub> Lean de-NO<sub>x</sub> and Tar Steam Reforming Reactions”, 1/2005- 4/2008; *Research Coordinator*, 127.000 €
20. Cyprus Research Promotion Foundation, Program: Cyprus-Greece Bilateral Collaboration, “Photoelectrolytic Oxidation and Immobilization of Organic Pollutants in Aqueous Media Using Solar Energy”, 6/2004 – 4/2007; *Research Coordinator*, 17.500 €
21. Cyprus Research Promotion Foundation, “Dinitrification of Industrial Effluent Streams” 7/2004 – 7/2007; *Research Coordinator*, 140.000 €
22. Cyprus Research Promotion Foundation, Program TEXNO/0603/11, “Hydrogen Production by Steam Reforming of Non-Recyclable Organic Solvents”, 6/2004 – 6/2007; *Research Coordinator*, 230.000 €
23. Cyprus Research Promotion Foundation, Program TEXNO/0609, “Development of an Industrial Catalytic Converter of NO<sub>x</sub> to N<sub>2</sub> Using Hydrogen under Strongly Oxidizing Conditions”, 6/2004 – 6/2007; *Research Coordinator*, 140.000 €
24. Cyprus Research Promotion Foundation, Program TEXNO/0609, “Regeneration of Three-Way Commercial Catalytic Converters”, 6/2004-6/2007; *Research Coordinator*, 135.000 €
25. European Union, 5<sup>th</sup> Framework Program, Energy, Environment and Sustainable Development, “A New Approach for the Production of a Hydrogen-Rich Gas from Biomass-An Absorption Enhanced Reforming Process”, 2002-2005; *Contractor Partner*, 245.000 €
26. Cyprus Research Promotion Foundation, Program: Cyprus-Greece Bilateral Collaboration, “Development of Nanostructured Supported Ag-Pt and Ag-Rh Catalysts for the Selective Reduction of NO and N<sub>2</sub>O Decomposition”, 6/2004 – 6/2006; *Contractor Partner*, 17.500 €
27. European Union, 5<sup>th</sup> Framework Program, GROWTH-Promoting Competitive and Sustainable Growth, RTD Project, “Improvement of the ceramic substrate of three-way catalysts (TWC) to develop a regeneration and/or reactivation procedure of used catalyst” 2001-2004; *Contractor Partner*; 240.000 €
28. European Union, 5<sup>th</sup> Framework Program, Environment and Sustainable Development, RTD Project, “Development of technologies using the activity of sulfate- and metal-reducing bacteria (SMRB) to remove heavy metals and metalloids from ground waters and soils”, 2000-2003 *Contractor Partner*; 87.000 €



29. University of Cyprus, “Development of New Materials for Lean De-NO<sub>x</sub> Using Hydrogen”, 2000-2003; *Research Coordinator*; 130.000 €
30. Planning Bureau, Ministry of Agriculture, Natural Resources and Environment (Cyprus) Programme: Thrace-Egao-Cyprus, “Recycling of Materials in Small Towns”, 2001-2003; *Research Coordinator*, 43.500 €
31. University of Cyprus, “Regeneration of Commercial Three-Way Catalysts”, 2003-2004; *Research Coordinator*, 25.500 €
32. European Economy Community Action for Cooperation in Sciences and Technology with Central and Eastern European Countries, “Transient Adsorption Studies: In Situ Determination of Surface Heterogeneity”, 1993-1994; *Research Coordinator*, 8.000 €
33. European Union, 4<sup>th</sup> Framework Program, ENVIRONMENT “Improvement of NO<sub>x</sub> Reduction Catalysts”, 1993-1996; *Contractor Partner*, 150.000 €

**Total Funding: 3.393.300 €**

## **B. Industry**

34. SASOL Technology Ltd (South Africa), Project: “Mechanistic studies and advanced characterization of Fischer-Tropsch commercial Co-based catalysts”, 2014-2026; 1.2 M €
35. MEL Chemicals Ltd (Manchester, UK), Project: “Improving the performance of transient oxygen storage and release properties of commercial ceria-zirconia-based materials towards TWC applications”, and “Patent Infringement Studies”, 6/2013 – 6/2018; 250,000 €
36. Linde Engineering AG (Munich, Germany), Project: Execution of Licence Agreement, “Commercialization of H<sub>2</sub>-SCR of NO – Patent Exploitation”, 6/2008 – 5/2010; 150.000 €
37. MEL Chemicals Ltd (Manchester, UK), Project: “Studying the Transient Oxygen Storage and Release Properties of Various Commercial Ceria- and Zirconia-based Materials Towards TWC Applications”, 1/2008 – 12/2009; 100.000 €

**Total Funding: 1.700.000 €**

## **Consultancy**

- SASOL Technology SA (South Africa). “Investigation of the mechanism of FT synthesis on Co-based catalysts”, 7/2013 – present
- MEL Chemicals/MEI (Manchester, UK). “Dynamic Oxygen Storage and Release Properties of Ceria- and Zirconia-based Products: Towards Better design of Their TWC Applications”  
1/2008 – 6/2009; 7/2013 – 12/2018
- TASNI TRADING Co (Nicosia, CYPRUS), Project: Measurements of atmospheric pollution, 9/1999- 9/2000

## **External Member of Ph.D Examination Committees**

- Department of Chemical Engineering and Chemistry, Eindhoven University of Technology (TU/e) (PhD student. J.F.M. Simons; Supervisor Prof. Emiel J.M. Hensen), *Independent Examiner*, Thesis title: “Ni-catalyzed CO<sub>2</sub> hydrogenation”, 6/2023
- Department of Biotechnology and Chemical Technology, Aalto University, Helsinki-Finland, *PhD Thesis Opponent* (PhD student Sonja Kouva; Supervisor Dr. J.M. Kanervo), Thesis title: “Temperature-programmed methods for probing surface interactions on catalytic oxide materials”, 11/2015
- Department of Chemistry, University of Cyprus. Thesis title: “Studies of the shape of N<sub>2</sub> adsorption isotherm on ZSM-5 zeolite”, 4/2008
- Department of Chemistry, University of Cyprus. Thesis title: “Synthesis and characterization of mesoporous ceria”, 12/2007

Department of Chemistry, University of Cyprus. Thesis title: “Synthesis of mixed metal oxides of  $Mn_xCe_{1-x}O_{2-y}$  ( $x=0-1$ ) and studies of the influence of various synthesis parameters on the surface properties of ceria and its derivatives”, 5/2007

Department of Chemistry, University of Cyprus. Thesis title: “The effects of dopants ( $Cu^{2+}$ ,  $Mn^{2+}$ ,  $Ni^{2+}$  and  $La^{3+}$ ) on the textural properties of doped  $CeO_2$ ”, 3/2006

Faculty of Sciences and Technology (Chemistry), University of Claude Bernard-Lyon 1 (France). Thesis title: “Transient kinetic and modeling studies of CO oxidation reaction” (Supervisor Prof. D. Bianchi), 4/2003

Department of Chemistry, University of Ioannina (Greece). Thesis title: “Preparation, characterization and catalytic performance of Fe-based perovskite materials” (Supervisor Prof. P. J. Pomonis), 4/2000

Department of Natural Sciences, University of Cyprus. Thesis title: “Studies of surface structure of adsorptive materials with environmental applications”, 11/1997

Faculty of Sciences and Technology (Chemistry), University of Claude Bernard-Lyon 1 (France). Thesis title: “Intermediate species in the synthesis of methanol over CuO/ZnO aerogels supported on zirconia” (Supervisor Prof. D. Bianchi), 6/1992

### **Supervision of Postgraduate Students / Postdocs**

(i) Awarded PhDs: 15

Mr. Constantinos Damaskinos, 2/2022

Thesis title: “Dry Reforming of Methane over Supported Ni-based Bimetallic Catalysts: Performance, Kinetic and Mechanistic Studies” (1500 € Award for a publication from his thesis with the highest Impact Factor (Appl. Catal. B: Environ., IF: 19.5)

Mr. Michalis Vasiliades, 5/2017

Thesis title: “Mechanistic Studies of the Catalytic Dry Reforming of Methane and Fischer-Tropsch Reaction by Transient Isotopic Techniques”

Ms. Klito C. Petallidou, 5/2014

Thesis title: “Development of New Ceria-Based Materials for the Low-Temperature Water-Gas Shift Reaction”

Mr. Constantinos L. Constantinou, 5/2013

Thesis title: “Selective Catalytic Reduction of Nitrates in Waters over Supported Pd-Cu Catalysts”

Mr. George G. Olympiou, 7/2011

Thesis title: “Selective Catalytic Reduction of  $NO_x$  with  $H_2$  ( $H_2$ -SCR) on Supported Pt: Effect of Support and Chemical Promoters”

Mr. Christos Kalamaras, 5/2011

Thesis title: “Low-Temperature Water-Gas Shift Reaction: Catalytic and Mechanistic Studies” (Award for the best PhD thesis in the School of Pure and Applied Sciences, Univ. of Cyprus).

Ms. Domna Constantinou, 11/2010

Thesis title: “Steam Reforming of Phenol and Toluene over Natural Materials and Supported Metal Catalysts”

Mr. Petros G. Savva, 5/2008

Thesis title: “Hydrogen Production over Supported-Ni catalysts and  $H_2$ -SCR of NO at Low-Temperatures over Supported-Pt and Pd Catalysts”

Ms. Tasoula N. Anastasiadou, 5/2006

Thesis title: “Selective Catalytic Reduction of NO by  $CH_4$  and  $H_2$  under Strongly Oxidizing Conditions over  $La_2O_3$ -CaO and Supported-Pd Catalysts”

Ms. Stavroula Y. Christou, 4/2006

Thesis title: “Fundamental Studies of the Oxygen Storage and Release Phenomena over Pd/ $Ce_xZr_{1-x}O_2$  Solids and of Regeneration Methods of Three-Way Catalysts”

Ms. Panayiota S. Lambrou, 5/2006

Thesis title: "Studies of the Oxygen Storage and Release Phenomena over Aged and Regenerated TWCs: Effects of Various Pollutants and Regeneration Methods"

Ms. Kyriaki Polychronopoulou, 4/2005

Thesis title: "Synthesis of New Solid Absorbents of H<sub>2</sub>S and Novel Catalysts for Steam Reforming of Phenol: Physicochemical, Catalytic and Mechanistic Studies"

Mr. Costas N. Costa, 1/2003

Thesis title: "The Selective Catalytic Reduction of NO by Hydrogen under Strongly Oxidizing Conditions over Supported-Pt Catalysts"

Ms. Katerina Fliatoura, 6/1997

Department of Chemical Engineering, University of Patras, Greece. Joint supervision with Professor X.E. Verykios.

Thesis title: "Selective Catalytic Reduction of NO in the Presence of Excess Oxygen by Using Ammonia and Hydrocarbons over Supported Vanadia and Calcium Oxide Catalysts"

Mr. Dimitris Papageorgiou, 6/1995

Department of Chemical Engineering, University of Patras, Greece. Joint supervision with Professor X.E. Verykios

Thesis title: "Oxidative Coupling of Methane to C<sub>2</sub>-Hydrocarbons"

(ii) Awarded MSc: 4

Ms. Konstantina Kyprianou, 6/2022 – 5/2023

Thesis title: "The Methanation Reaction over Model and Commercial Co-based Catalysts: Kinetic and Mechanistic Studies by Transient Isotopic Techniques"

Ms. Zena Savva, 11/2017

Thesis title: "The Selective Catalytic Reduction of NO by Hydrogen over Ceria-supported Pd Catalysts"

Ms. Maria Makri, 5/2016

Thesis Title: "Dry Reforming of Methane with Carbon Dioxide over Ni/Ce<sub>1-x</sub>Pr<sub>x</sub>O<sub>2</sub>: Effect of Pr-dopant on Carbon Formation"

Ms. Zena Theodorou, 2/2006

Thesis title: "New Catalysts Development towards H<sub>2</sub> Production by Steam Reforming of Toluene and Phenol-Toluene Mixtures"

(iii) Visiting Postgraduate Students

Ms. Rongrong Gui, Forestry University, Beijing – China; 11/2023 – 10/2024 (1-year fellowship from the Chinese government); Project: Mechanistic studies of NH<sub>3</sub>-SCR and CO<sub>2</sub> hydrogenation over Layered Double Oxides (LDO) materials.

Mr. Cheng Zhang, Forestry University, Beijing – China; 1/2021- 5/2023 (2-year fellowship from the Chinese government); Project: Mechanistic studies of NH<sub>3</sub>-SCR and H<sub>2</sub>-SCR over Layered Double Oxides (LDO) materials.

Ten (10) PhD students from Greek Universities – Chemistry/Chemical Engineering Departments visited the heterogeneous catalysis labs at the University of Cyprus for a short stay (1-2 months), 2005 – 2023.

(iv) Post-doctoral fellows: 8

Dr. Michalis Vasiliades, 6/2017 – today (PhD University of Cyprus)

Dr. Klito Petallidou, 6/2014 – 3/ 2017; Marie-Curie Fellow, 2/2018 - 2/2020 (PhD University of Cyprus)

Dr. Christos M. Kalamaras, 6/2011 – 8/2013 (PhD University of Cyprus)

Dr. Petros G. Savva, 5/2008 – 12/2008 (PhD University of Cyprus)

Dr. Stavroula Christou, 6/2006 – 6/2012 (PhD University of Cyprus)

Dr. Constantinos Zeinalipour-Yazdi, 1/2006 – 1/2009 (PhD University of California Los Angeles)

Dr. Costas N. Costa 2/2003 – 6/2006 (PhD University of Cyprus)  
Dr. Kyriaki Polychronopoulou 6/2005 – 6/2007 (PhD University of Cyprus)

### **Academic / Research Employment of PhD Students**

Dr. Costas Costa, *Full Professor* (2016 - today), Cyprus University of Technology, Chemical Engineering Department, Limassol-Cyprus.

Dr. Kyriaki Polychronopoulou, *Full Professor* (2020 - today), Khalifa University (Mechanical Engineering Department), Director (2018 - today) – Center for Catalysis and Separations (CeCaS), Abu Dhabi (UAE).

Dr. Christos Kalamaras, *ARAMCO* (Saudi Arabia), 2015 – today.

Dr. Klito Petallidou, *Research Lecturer*, Cyprus Institute (CyI), Nicosia-Cyprus (2021 – today).

### **Scientific Conferences – Organizer / Committee Member / Chair**

Organizer, 17<sup>th</sup> Panhellenic Catalysis Symposium, 7-9 October 2024, Paphos, Cyprus

Member of International Scientific Committee, “Ceria 2024 Conference”, Portoroz-Slovenia, 17-20 Sept. 2024

Chairman, European Congress on Catalysis - EUROPACAT-XV, Session: Surface science & atomic level models: experiment and theory, 27 Aug. – 1 Sept 2023, Prague, Czech Republic.

Member of Scientific Committee/Chair, 16<sup>th</sup> Panhellenic Catalysis Symposium, 20-22 October 2022, Chania, Greece.

Chairman, European Congress on Catalysis - EUROPACAT-XIV, Session: Advanced Fischer-Tropsch, 19-23 Aug. 2019, Aachen, Germany.

Member of Scientific Committee/Chair, 15<sup>th</sup> Panhellenic Catalysis Symposium, 18-20 October 2018, Ioannina, Greece.

Chairman, European Congress on Catalysis-Europacat-XIII, Session: Catalytic Mechanisms, 27-30 Aug. 2017, Florence, Italy.

Member of Scientific Committee/Chair, 14<sup>th</sup> Panhellenic Catalysis Symposium, 13-15 October 2016, Patras, Greece.

Member of Scientific Committee/Chair, 13<sup>th</sup> Panhellenic Catalysis Symposium, 16-18 October 2014, Palaios Agios Athanasios, Greece.

Member of Panel Discussions, 9<sup>th</sup> International Congress on Catalysis and Automotive Pollution Control (CAPoC9), 29-31 Aug. 2012, Bruxelles, Belgium.

Organizer and Chair Session, University of Cyprus (Cyprus European Office), International Conference “EASTMEETS WEST 2012 Congress and Exhibition”, Session 1.25: Catalytic NO<sub>x</sub> Control Systems: Current State and Future Developments”, 1-4 September 2012, Nicosia, Cyprus.

Member of Scientific Committee/Chair, 12<sup>th</sup> Panhellenic Catalysis Symposium, 25-27 October 2012, Chania, Greece.

Co-Chairman, European Congress on Catalysis – EUROPACAT-X, Session: Mechanisms and Kinetics, 28 Sept. – 2 Aug. 2011, Glasgow, UK.

International Scientific Advisor, Bilateral Indo-French Symposium on Catalysis for Sustainable and Environmental Chemistry, National Chemical Laboratory, 11-14 July 2010, Pune, India.

Member of Scientific Committee/Chair, 11<sup>th</sup> Panhellenic Catalysis Symposium, 22-23 October 2010, Athens, Greece.

Co-organiser (University of Cyprus-Aristotle University of Thessaloniki-University of Crete), 2<sup>nd</sup> European Conference on Environmental Applications of Advanced Oxidation Processes, 9-11 Sept. 2009, Nicosia, Cyprus.

Member of Scientific Committee/Chair, 10<sup>th</sup> Panhellenic Catalysis Symposium, 3-4 October 2008, Metsovo, Greece.

Co-Chairman, III International Conference “Catalysis: Fundamentals and Application-Session Young Scientists”, 4-8 July 2007, Novosibirsk, Russia.

Co-Chairman, 7<sup>th</sup> International Congress on Catalysis and Automotive Pollution Control - Session NO<sub>x</sub> Control, 29 Aug. – 1 Sept. 2006, Brussels, Belgium.

Member of Scientific Committee/Chair, 9<sup>th</sup> Panhellenic Catalysis Symposium, 6-7 October 2006, Lefkada, Greece.

Co-Chairman, 7<sup>th</sup> European Catalysis Conference (EUROPACAT-VII) “Catalysis: A Key to a Richer and Cleaner Society” - Symposium 3: “Theoretical Methods and Fundamental Studies in Catalysis”, 28 Aug. – 1 Sept. 2005, Sofia, Bulgaria.

Organizer, 8<sup>th</sup> Panhellenic Catalysis Symposium, 30 Oct – 1 Nov. 2004, Agia Napa, Cyprus.

Member of Scientific Committee, 8<sup>th</sup> Greece-Cyprus Chemistry Symposium, 10-13 December 2004, Thessaloniki-Greece.

## Research Presentations

Invited Lectures in Universities, Research Centers, Industry and Conferences	26
Referred Publications in International Conference Proceedings	35
Referred Publications in Greek Conference Proceedings	35
Refereed Oral Presentations in International Conferences	41
Refereed Poster Presentations in International Conferences	34
Presentations in Greek Conferences (Oral and Posters)	37

*\*see details below*

## Invited Lectures

November 2019, *Plenary Lecture*, Catalysis Society of South Africa Conference – 2019, Cape Town, South Africa.

November 2018, “Environmental Functional Catalytic Materials: Design and Development Using Transient Techniques and Operando Methodologies”, Beijing Forestry University, Beijing, China (Prof. Qiang Wang).

November 2018, “DeNO<sub>x</sub> Catalysis Studied by Transient Isotopic Techniques”, Tsinghua University, Beijing, China (Prof. Junhua Li).

December 2016, “Syngas/Hydrogen Production and Utilization: How *operando* SSITKA Combined with Other Transient Experiments Advance Catalyst Design”, ETH Zurich, Switzerland (Prof. S.E. Pratsinis).

February 2015, Pregl Colloquium, “Fundamental Understanding of De-NO<sub>x</sub> and WGS Catalysis Using Transient Isotopic Techniques”, National Institute of Chemistry, Slovenia (Prof. Albin Pintar).

September 2014, *Plenary Lecture* “Fundamental Understanding of De-NO<sub>x</sub> Catalysis Using Transient and Transient Isotopic Techniques”, International Symposium on Air& Water Pollution Abatement Catalysis (AWPAC 2014), Krakow, Poland (Prof. Zbigniew Sojka, Chemistry Dept).

July 2014, *Keynote Lecture*, “Mechanistic Studies in Water-Gas Shift Reaction via *Operando* Transient Isotopic Techniques”, in “Fundamentals and Applications of Cerium Dioxide in Catalysis, Advanced Course” (Coordinators: Profs A Trovarelli and P. Fornasiero), Udine, Italy.

June 2013, “Catalysis Course - Characterization of Solid Materials: The use of SSITKA Technique”, University of Oulu, Finland (Prof. Riita Keiski).

November 2012, “Natural Gas as a Feedstock for High Added Value Chemicals and Alternative Fuels”, 1<sup>st</sup> Conference on Power Options for the Eastern Mediterranean Region (POEM 2012), Limassol, Cyprus.

June 2010, “Green and Novel Low-Temperature ( $T < 200^\circ\text{C}$ ) Industrial  $\text{NO}_x$  Control Catalytic Technologies for Stationary Applications:  $\text{H}_2$ -SCR?”, 9<sup>th</sup> International Symposium of the Romanian Catalysis Society (RomCat 2010), 23-26 June, Iasi, Romania (Prof. Vasile Parvulescu).

July 2010, “Green and Novel Low-Temperature ( $T < 200^\circ\text{C}$ ) Industrial  $\text{NO}_x$  Control Catalytic Technologies for Stationary Applications:  $\text{H}_2$ -SCR?”, Bilateral Indo-French Symposium on Catalysis for Sustainable and Environmental Chemistry, 11-14 July, Pune, India (Prof. Pascal Grange).

October 2009, “Operando-SSITKA and Transient Isotopic Techniques as Powerful Tools to Elucidate Catalytic Reaction Mechanisms: The Case of  $\text{H}_2$ -SCR and WGS Reactions”, Fritz-Haber Institut der Max-Planck, Berlin, Germany (Prof. Hans-Joachim Freund).

October 2009, “Low-Temperature  $\text{H}_2$ -SCR”, W.C. Heraeus GmbH, Hanau, Germany.

June 2009, “Towards Clean and Green Low-Temperature ( $T < 200^\circ\text{C}$ ) Industrial  $\text{NO}_x$  Control Catalytic Technologies for Stationary Applications:  $\text{H}_2$ -SCR?”, 3<sup>rd</sup> North America-Greece-Cyprus Workshop on Paramagnetic Materials, Protaras, Cyprus.

September 2007, “Towards Green Low-Temperature ( $T < 200^\circ\text{C}$ )  $\text{NO}_x$  Control Catalytic Technologies for Stationary Sources:  $\text{H}_2$ -SCR?”, University of Poitiers-CNRS, Poitiers, France (Prof. Daniel Duprez).

June 2007, “Towards Green Low-Temperature ( $T < 200^\circ\text{C}$ )  $\text{NO}_x$  Control Catalytic Technologies for Stationary Sources:  $\text{H}_2$ -SCR?”, *Plenary Lecture, Gordon Conference “Past and Present in De $\text{NO}_x$  Catalysis: From Molecular Modeling to Chemical Engineering”*, Danube Delta, Romania.

December 2006, “ $\text{H}_2$ -SCR: A Novel Green Catalytic Technology for the Selective Reduction of  $\text{NO}_x$  into  $\text{N}_2$  at Low-Temperatures”, National Research Institute (EIE), Athens, Greece.

October 2006, “ $\text{H}_2$ -SCR: A Novel Green Catalytic Technology for the Conversion of  $\text{NO}_x$  into  $\text{N}_2$  at Low-Temperatures”, *Keynote Lecture*, 9<sup>th</sup> Panhellenic Catalysis Conference, Lefkada, Greece.

January 2005, “The Role of Oxygen and Hydroxyl Support Species on the Mechanism of  $\text{H}_2$  Production in the Steam Reforming of Phenol and Toluene over Metal Oxide-Supported Rh and Fe Catalysts”, Co-ordination of Nanostructured Catalytic Oxides Research and Development in Europe, Louvain-la-Neuve, Belgium.

December 2004, “A Novel Selective Catalytic Reduction of NO by Hydrogen for Stationary and Mobile Applications”, 8<sup>th</sup> Chemistry Conference Greece-Cyprus, Thessaloniki, Greece.

January 2004, “The Mechanism of Catalytic Reduction of NO by  $\text{H}_2$  in the Presence of  $\text{O}_2$  (Lean De- $\text{NO}_x$ ) over Supported-Pt Catalysts: The Effect of Support Chemical Composition and Pt Particle Size”, Inorganic Reaction Mechanisms Meeting 2003, Royal Society of Chemistry, Dalton Division, Athens, Greece.

October 2003, “ $\text{H}_2$ -SCR of NO at Low-Temperatures: A New De- $\text{NO}_x$  Technology”, Institute of Catalysis y Petroleoquimica, CSIC-Madrid.

December 1999, “Manganese-based Porous Mixed Oxides (MANPO) of High Surface Area as Catalysts for Low-Temperature Lean de- $\text{NO}_x$  Applications”, 6<sup>th</sup> Network for Industrial Catalysis in Europe (NICE), -Challenges & Opportunities in Multi-phase Catalysis, EniTecnologie, Milano, Italy.

May 1999, “The Current State of Catalytic Reduction of NO in the Presence of Excess Oxygen”, Department of Chemistry, University of Ioannina, Greece.

May 1999, “Transient Methods in Heterogeneous Catalysis”, Department of Chemistry, University of Patras, Greece.

March 1992, “The  $\text{CO}/\text{H}_2$  Reaction on  $\text{Rh}/\text{Al}_2\text{O}_3$ . A Steady-State Tracing Kinetic Study”, Institut de Recherches sur la Catalyse (CNRS), Villeurbanne, France.



## Oral Presentations – Refereed International Conferences

M.A. Vasiliades, N.S. Govender, A. Govender, R. Crous, D. Moodley, T. Botha, [A.M. Efstathiou](#) (2023), “Effect of H<sub>2</sub> pressure on the carbon path of methanation reaction on Co/ $\gamma$ -Al<sub>2</sub>O<sub>3</sub> studied by transient isotopic and operando methodologies”, Europacat-15, Aug 27-Sept 1, Prague, Czech Republic.

M.A. Vasiliades, N.S. Govender, A. Govender, R. Crous, D. Moodley, T. Botha, [A.M. Efstathiou](#) (2023), “Effect of H<sub>2</sub> pressure on the carbon path of methanation reaction on Co/ $\gamma$ -Al<sub>2</sub>O<sub>3</sub> studied by transient isotopic and operando methodologies”, Natural Gas Convention 4, April 2-5, Cape Town, S. Africa.

C.M. Damaskinos, [M.A. Vasiliades](#), [A.M. Efstathiou](#) (2023), “Advancement of design of Ni/Ce<sub>0.8</sub>Ti<sub>0.2</sub>O<sub>2- $\delta$</sub>  for the Dry Reforming of Methane using transient and isotopic techniques”, Natural Gas Convention 4, April 2-5, Cape Town, S. Africa.

D.M. Damaskinos, M.A. Vasiliades, [A.M. Efstathiou](#) (2019), “Understanding the effect of Pt and M (Pr<sup>3+</sup>, Ti<sup>4+</sup>) in the doped-Ce<sub>1-x</sub>M<sub>x</sub>O<sub>2- $\delta$</sub>  supported NiPt catalysts on the carbon pathways in the dry reforming of CH<sub>4</sub> by various transient and isotopic experiments”, 19<sup>th</sup> National Congress of Catalysis China, October 14-17, Chongqing, China.

M.A. Vasiliades, C.M. Kalamaras, N.G. Govender, A. Govender, [A.M. Efstathiou](#) (2019), “The effect of preparation route of commercial Co/ $\gamma$ -Al<sub>2</sub>O<sub>3</sub> Fischer-Tropsch catalyst on important kinetic parameters studied by SSTKA and other transient techniques” EuropaCat-14, 18-23 August, Aachen, Germany.

M.A. Vasiliades, M.M. Makri, K.C. Petallidou, [A.M. Efstathiou](#) (2016), “Understanding the Effects of Support Chemical Composition on the Origin and Reactivity of Carbon Formed During Dry Reforming of CH<sub>4</sub> over Ni/Ce<sub>1-x</sub>M<sub>x</sub>O<sub>2- $\delta$</sub>  (M=Zr<sup>4+</sup>, Pr<sup>3+</sup>) via Transient Isotopic Techniques”, 11<sup>th</sup> Natural Gas Conversion Symposium (11<sup>th</sup> NGCS), 5-9 June, Tromsø, Norway.

C.M. Kalamaras, [A.M. Efstathiou](#) (2013), “Understanding the Effect of Support Chemical Composition on the Mechanism of WGS Reaction over Supported Pt via Transient Isotopic Techniques”, 10<sup>th</sup> Natural Gas Conversion Symposium (10<sup>th</sup> NGCS), March 2-7, Doha, Qatar.

K.C. Petallidou, [K. Polychronopoulou](#), [A.M. Efstathiou](#) (2013), “Enlightening New Aspects of Modified-CeO<sub>2</sub> WGS Catalytic Performance Through Addition of Trivalent (La<sup>3+</sup>) and Tetravalent (Ti<sup>4+</sup>) Ions and Subsequent Hybridization with Carbon Nanostructures”, Materials Research Society (MRS), Spring Meeting & Exhibit, 1-5 April, San Francisco, California-USA.

[A.M. Efstathiou](#), C.K. Kalamaras (2013), “Mechanistic Aspects of the Selective Catalytic Reduction of NO<sub>x</sub> Using H<sub>2</sub>/C<sub>3</sub>H<sub>6</sub> Gas Mixtures over Pt/Ce<sub>x</sub>Zr<sub>1-x</sub>O<sub>2</sub> Catalysts”, European Congress on Catalysis – XI (EUROPACAT-XI)”, 1-6 September, Lyon, France.

S.Y. Christou, [A.M. Efstathiou](#) (2012), “The Effects of P-poisoning of Ce<sub>x</sub>Zr<sub>1-x</sub>O<sub>2</sub> on the Transient Oxygen Storage and Release Kinetics”, 9<sup>th</sup> International Congress on Catalysis and Automotive Pollution Control (CAPoC9), August 29-31, Bruxelles, Belgium.

[K.C. Petallidou](#), [K. Polychronopoulou](#), [A.M. Efstathiou](#) (2012), “Novel Catalytic Systems for Hydrogen Production via the Water-Gas Shift Reaction”, 1<sup>st</sup> Conference on Power Options for the Eastern Mediterranean Region (POEM 2012), 19-21 November, Limassol, Cyprus.

[C.M. Kalamaras](#), [A.M. Efstathiou](#) (2012), “Hydrogen Production Technologies: Current State and Future Developments”, 1<sup>st</sup> Conference on Power Options for the Eastern Mediterranean Region (POEM 2012), 19-21 November, Limassol, Cyprus.

P.G. Savva, U. Wenning, N. Schoedel, [A.M. Efstathiou](#) (2009), “Low-Temperature H<sub>2</sub>-SCR of NO<sub>x</sub> on a Novel Pt/MgO-CeO<sub>2</sub> Catalyst: Effects of Pd and Support Primary Crystal Size”, European Congress on Catalysis – IX (EUROPACAT-IX)”, 30 Aug. – 4 Sept., Salamanca, Spain.

[C.L. Constantinou](#), C.N. Costa, [A.M. Efstathiou](#) (2009), “Catalytic Removal of Nitrates from Water by the Use of H<sub>2</sub>/air Reducing Atmospheres”, 2<sup>nd</sup> European Conference on Environmental Applications of Advanced Oxidation Processes, 9-11 September, Nicosia, Cyprus.

[D.A. Constantinou](#), [A.M. Efstathiou](#) (2009), “The Steam Reforming of Phenol over Natural Calcite Materials”, International Symposium on “Catalysis for Clean Energy and Sustainable Chemistry”, 17-20 June, Madrid, Spain.

[D.A. Constantinou](#), [A.M. Efstathiou](#) (2009), “Novel Catalytic Systems for the Purification of Syngas from Tars Produced in Biomass Gasification”, 5<sup>th</sup> Dubrovnik Conference on Sustainable Development of Energy, Water and Environmental Systems, Sept. 30-Oct. 3, Dubrovnik, Croatia.

P.G. Savva, C.N. Costa, A.M. Efstathiou (2007), “The Mechanism of Reduction of NO with H<sub>2</sub> in Strongly Oxidizing Conditions (H<sub>2</sub>-SCR) on a Novel Pt/MgO-CeO<sub>2</sub> Catalyst: Effects of Reaction Temperature”, III International Conference, Catalysis: Fundamentals and Application, 4-8 July, Novosibirsk, Russia.

P.G. Savva, C.N. Costa, A.M. Efstathiou (2007), “Low-Temperature H<sub>2</sub>-SCR of NO on a Novel Pt/MgO-CeO<sub>2</sub> Catalyst: A Comprehensive Elucidation of Bifunctional Catalysis”, European Congress on Catalysis – VIII (EUROPACAT-VIII), 26-31 August, Turku, Finland.

C.M. Kalamaras, G.G. Olympiou, C.D. Zeinalipour-Yazdi, A.M. Efstathiou (2007), “Operando DRIFTS-Mass Spectroscopy Studies of the Water-Gas Shift Reaction over Alumina-supported Noble Metal Catalysts”, European Congress on Catalysis – VIII (EUROPACAT-VIII), 26-31 August, Turku, Finland.

P.G. Savva, C.N. Costa, V.A. Ryzhkov, A.M. Efstathiou (2005), “Clean Hydrogen Production by Ethylene Decomposition over Ni Supported on Novel Carbon Nanotubes”, European Congress on Catalysis-VII (EUROPACAT-VII), 28 Aug. – 1 Sept., Sofia, Bulgaria.

K. Polychronopoulou, C.N. Costa, A.M. Efstathiou (2005), “The Mechanism of H<sub>2</sub> Production in the Phenol Steam Reforming Reaction over Supported-Rh and Fe Catalysts: SSITKA and other Transient D and <sup>18</sup>O Isotopic Experiments”, European Congress on Catalysis-VII (EUROPACAT-VII), 28 Aug. – 1 Sept., Sofia, Bulgaria.

V.C. Belessi, V.N. Stathopoulos, T.V. Bakas, C.N. Costa, P.J. Pomonis, A.M. Efstathiou (2005), “Comparative Catalytic Study of NO/CH<sub>4</sub>/O<sub>2</sub> and NO/H<sub>2</sub>/O<sub>2</sub> lean de-NO<sub>x</sub> Reactions over La-Sr-Fe-O Perovskite-type Oxides Prepared by Ceramic and Surfactant Methods”, European Congress on Catalysis-VII (EUROPACAT-VII), 28 Aug. – 1 Sept., Sofia, Bulgaria.

S.Y. Christou, A. Charalambides, A.M. Efstathiou (2005), “Management of Deactivated Commercial Three-Way Catalysts”, ECO Forum, 1<sup>st</sup> International Symposium for the Management, Policy and Technology of the Environment, 28-30 June, Nicosia, Cyprus.

C.N. Costa, A.M. Efstathiou (2005), “Green Technology for the Selective Catalytic Reduction of NO<sub>x</sub>”, ECO Forum, 1<sup>st</sup> International Symposium for the Management, Policy and Technology of the Environment, 28-30 June, Nicosia, Cyprus.

K. Polychronopoulou, P.G. Savva, C.N. Costa, V.A. Ryzhkov, A.M. Efstathiou (2005), “Green Technologies for Hydrogen Production”, ECO Forum, 1<sup>st</sup> International Symposium for the Management, Policy and Technology of the Environment, 28-30 June, Nicosia, Cyprus.

K. Polychronopoulou, I. Zacharaki, A.M. Efstathiou (2005), “New Aspects of the Hydrogen Production by Steam Reforming of Phenol over Supported-Rh Catalysts”, 2<sup>nd</sup> International Conference on Hydrogen Era”, October 16-19, Palermo, Italy.

K. Polychronopoulou, Z.I. Theodorou, C.N. Costa, A.M. Efstathiou (2004), “Hydrogen Production by Steam Reforming of Phenol over Novel Supported-Rh and Fe Catalysts”, 13<sup>th</sup> International Congress on Catalysis, 11-16 July, Paris, France.

C.N. Costa, A.M. Efstathiou (2003), “A Novel Active, Selective and Stable Pt/Mg-Ce-O Catalyst for the NO/H<sub>2</sub>/O<sub>2</sub> (Lean de-NO<sub>x</sub>) Reaction: Catalytic and Mechanistic Studies”, EuropaCat-VI Conference, Aug. 31-Sept. 4, Innsbruck, Austria.

C.N. Costa, A.M. Efstathiou (2001), “A Highly Active and Selective Pt/Support Catalyst for the NO/H<sub>2</sub>/O<sub>2</sub> (lean de-NO<sub>x</sub>) Reaction”, 1<sup>st</sup> EFCATS School on Catalysis, New Trends in Catalysis Research and Application, March, Prague, Czech Republic.

I. Ignatiadis, F. Battaglia-Brunet, M. Bruschi, C. Michel, B. Ollivier, J.L. Garcia, F. Glombitza, D. van der Lelie, L. Diels, I. Paspaliaris, N. Papassiopi, K. Polychronopoulou, A.M. Efstathiou (2001), “Development of Technologies Using the Activity of Sulfate- and Metal-Reducing Bacteria (SMRB) to Remove Heavy Metals and Metalloids From Ground Waters and Soils”, European Thematic Network on Extractive Industries, 4<sup>th</sup> Annual workshop, July 4-6, Stockholm, Sweden.

I. Ignatiadis, F. Battaglia-Brunet, M. Bruschi, A. Dolla, B. Ollivier, J.L. Garcia, F. Glombitza, Y. Fessas, D. Marggraff, D. van der Lelie, L. Diels, I. Paspaliaris, N. Papassiopi, A. Nefeloudis, A.M. Efstathiou (2000), “Development of Technologies Using the Activity of Sulfate- and Metal-Reducing Bacteria (SMRB) to Remove Heavy Metals and Metalloids From Ground Waters and Soils”, European Workshop on the protection of European water resources, contaminate sites, landfills and sediments, June, Venice, Italy.

V.C. Belessi, T.V. Bakas, C.N. Costa, T. Anastasiadou, A.M. Efstathiou, P.J. Pomonis (1999), “Catalytic Behavior of La-Sr-Ce-Fe-O Perovskites for the NO+CO and NO+CH<sub>4</sub>+O<sub>2</sub> Reactions”, European Congress on Catalysis-IV (EUROPACAT-IV), 5-10 Sept., Rimini, Italy.

J. Boukouvalas, Z.L. Zhang, A.M. Efstathiou, X.E. Verykios (1996), “Partial Oxidation of Methane to Synthesis Gas over Ru/TiO<sub>2</sub> Catalysts”, 11th International Congress on Catalysis, July, Baltimore, USA.

J. Boukouvalas, A.M. Efstathiou, Z. Zhang, X.E. Verykios (1995), “Partial Oxidation of Methane to Synthesis Gas over Supported Ruthenium Catalysts”, 4<sup>th</sup> International Natural Gas Conversion Symposium, 19-23 November, South Africa.

K. Fliatoura, A.M. Efstathiou, X.E. Verykios (1995), “Selective Catalytic Reduction of NO with NH<sub>3</sub> over V<sub>2</sub>O<sub>5</sub>/TiO<sub>2</sub> Catalysts”, 4th International Conference on Environmental Technology, September, Lesbos, Greece.

K. Fliatoura, A.M. Efstathiou, X.E. Verykios (1995), “The Selective Catalytic Reduction of NO with NH<sub>3</sub> over V<sub>2</sub>O<sub>5</sub>/TiO<sub>2</sub> Catalysts: Kinetic and Mechanistic Studies”, European Congress on Catalysis-II (EUROPACAT-II), 3-8 September, Maastricht, The Netherlands.

T. Ioannides, Z. Zhang, A.M. Efstathiou, X.E. Verykios (1993), “Dopant-Induced Metal Support Interactions and their Influence on Chemisorptive and Catalytic Parameters”, European Congress on Catalysis-I (EUROPACAT-I), September 12-17, Montpellier, France.

A.M. Efstathiou, D. Papageorgiou, X.E. Verykios (1993), “Mechanistic Aspects of the Oxidation Reaction Pathway of Carbonaceous Species to CO<sub>2</sub> over Li<sup>+</sup>-Doped TiO<sub>2</sub> OCM Catalyst”, European Congress on Catalysis-I (EUROPACAT-I), September 12-17, Montpellier, France.

A.M. Efstathiou, S.L. Suib, C.O. Bennett (1990), “Transient Diffusion Studies of H<sub>2</sub> and c-C<sub>3</sub>H<sub>6</sub> in Zeolites”, The Catalysis Society of New England, Spring Symposium, April, Yale University, Connecticut (USA).

A.M. Efstathiou, C.O. Bennett (1989), “A Study by Transient Isotopic Methods of the CO/H<sub>2</sub> Reaction on Rh/Al<sub>2</sub>O<sub>3</sub>”, The Catalysis Society of New England, Spring Symposium April, Yale University, Connecticut (USA).

A.M. Efstathiou, C.O. Bennett (1989), “The CO/H<sub>2</sub> Reaction on Rh/Al<sub>2</sub>O<sub>3</sub>. Transient Isotopic Kinetic Study”, AIChE Annual Meeting, paper No. 128c, November, San Francisco (USA).

## Poster Presentations - Refereed International Conferences

C.M. Damaskinos, M.A. Vasiliades, A.M. Efstathiou (2023), “Advancement of design of Ni/Ce<sub>0.8</sub>Ti<sub>0.2</sub>O<sub>2-δ</sub> for the dry reforming of methane using transient and isotopic techniques”, Europacat-15, Aug 27-Sept 1, Prague, Czech Republic.

M.A. Vasiliades, C.M. Damaskinos, K.K. Kyprianou, A.M. Efstathiou (2019), “The Effect of Pt and Dopant M (Pr<sup>3+</sup>, Ti<sup>4+</sup>) in the Ce<sub>1-x</sub>M<sub>x</sub>O<sub>2-δ</sub> – supported NiPt Catalyst on the Carbon Pathways in the Dry Reforming of Methane Studied by Transient and Isotopic Techniques”, 14th European Congress on Catalysis (EUROPACAT-14), 18-23 August 2019, Aachen, Germany.

K.C. Petallidou, M.A. Vasiliades, A.M. Efstathiou (2017), “The Effect of Co Particle Size and Time on Stream on the Deactivation of Co/γ-Al<sub>2</sub>O<sub>3</sub> in CO Hydrogenation Studied by SSITKA and DRIFTS Techniques”, European Congress on Catalysis – XIII (EUROPACAT-13), 27-31 Aug. 2017, Florence, Italy (*Best Poster Award*).

M.A. Vasiliades, P. Djinic, A. Pintar, A.M. Efstathiou (2017), “Dry Reforming of Methane over Ce<sub>0.38</sub>Zr<sub>0.62</sub>O<sub>2-δ</sub>-supported NiCo Catalysts: The Origin and Reactivity of Carbon Formed Studied by Transient Techniques”, European Congress on Catalysis – XIII (EUROPACAT-13), 27-31 Aug. 2017, Florence, Italy.

K.C. Petallidou, K. Polychronopoulou, A.M. Efstathiou (2013), “Low-Temperature Water-Gas Shift on Pt/Ce<sub>1-x</sub>La<sub>x</sub>O<sub>2-δ</sub>”, European Congress on Catalysis – XI (EUROPACAT-XI), 1-6 Sept. 2013, Lyon, France.

C.K. Kalamaras, K.C. Petallidou, A.M. Efstathiou (2013), “Mechanistic Aspects of the WGS Reaction over Ceria-based Supported Pt Catalysts”, European Congress on Catalysis – XI (EUROPACAT-XI), 1-6 Sept. 2013, Lyon, France.

S.Y. Christou, A.M. Efstathiou (2012), “Regeneration of Aged Commercial Three-Way Catalysts Using Cl-containing Reagents”, Preprints 9<sup>th</sup> International Congress on Catalysis and Automotive Pollution Control (CAPoC9), August 29-31, Bruxelles, Belgium.

C.M. Kalamaras, A.M. Efstathiou (2011), “Redox vs Associative Formate with –OH group Regeneration WGS Reaction Mechanism on Supported-Pt: Effect of Support Composition, Pt Particle Size and Reaction Temperature”, European Congress on Catalysis – X (EUROPACAT-X), 28 Sept. – 2 Aug., Glasgow, UK.

- S.Y. Christou, A.M. Efstathiou (2011), “Deterioration of the Oxygen Storage/Release and Catalytic Properties of Model Pd/Ce-Zr-O TWC by Phosphorus Poisoning”, European Congress on Catalysis – X (EUROPACAT-X), 28 Sept. – 2 Aug., Glasgow, UK.
- H. Bradshaw, S.Y. Christou, C. Butler, D. Harris, J.G. Darab, A.M. Efstathiou (2011), “Influence of Composition in Zr-Ce OSC Materials on Oxygen Mobility”, European Congress on Catalysis – X (EUROPACAT-X)”, 28 Sept. – 2 Aug., Glasgow, UK.
- S.Y. Christou, H. Bradshaw, C. Butler, J. Darab, A.M. Efstathiou (2009), “Effect of Thermal Aging on the Transient Kinetics of Oxygen Storage and Release of Commercial  $Ce_xZr_{1-x}O_2$ -based Solids”, 8<sup>th</sup> International Congress on Catalysis and Automotive Pollution Control (CAPoC8), 15-17 April, Brussels, Belgium.
- S.Y. Christou, J. Gasste, H.L. Karlsson, J.L.G. Fierro, A.M. Efstathiou (2009), “Regeneration of Aged Commercial Three-Way Catalytic Converters”, 8<sup>th</sup> International Congress on Catalysis and Automotive Pollution Control (CAPoC8), 15-17 April, Brussels, Belgium.
- C.M. Kalamaras, A.M. Efstathiou (2009), “Operando-SSITKA Studies of Water-Gas Shift Reaction over Metal Oxide Supported Pt Catalysts: The Role of Support on Reaction Mechanism”, European Congress on Catalysis – IX (EUROPACAT-IX)”, 30 Aug. - 4 Sept., Salamanca, Spain.
- D.A. Constantinou, A.M. Efstathiou (2009), “Catalytic and Mechanistic Studies of Phenol Steam Reforming Reaction over Natural Calcites”, European Congress on Catalysis – IX (EUROPACAT-IX)”, 30 Aug. - 4 Sept., Salamanca, Spain.
- C.D. Zeinalipour-Yazdi, A.M. Efstathiou (2009), “New Insights of the Water-Gas Shift Reaction Mechanism on a Rh Cluster”, European Congress on Catalysis – IX (EUROPACAT-IX)”, 30 Aug. - 4 Sept., Salamanca, Spain.
- I.D. González Jiménez, C.M. Kalamaras, A.M. Efstathiou, F. Rosa, R.M. Navarro Yerga, J.L.G. Fierro (2009), “Mechanistic Insight in the Water-Gas Shift Reaction over Pt Supported on  $TiO_2$ ,  $CeO_2$  and  $CeO_2$ - $TiO_2$ ”, European Congress on Catalysis – IX (EUROPACAT-IX)”, 30 Aug. - 4 Sept., Salamanca, Spain.
- S.Y. Christou, H. Bradshaw, C. Butler, J. Darab, A.M. Efstathiou (2009), “Effect of Thermal Aging on the Transient Kinetics of Oxygen Storage and Release of Commercial  $Ce_xZr_{1-x}O_2$ -based Solids”, European Congress on Catalysis – IX (EUROPACAT-IX)”, 30 Aug. - 4 Sept., Salamanca, Spain.
- H. Bradshaw, A.M. Efstathiou, S.Y. Christou (2008), “Estimation of Oxygen Diffusion in Ceria-Zirconia Used in TWC Applications by Transient Isotopic  $^{18}O_2$  Exchange Studies”, 14<sup>th</sup> International Congress on Catalysis, 13-18 July, Seoul, South Korea.
- M.L. Granados, F.C. Galisteo, P.S. Lambrou, M. Alifanti, R. Mariscal, A. Gurbani, J. Sanz, I. Sobrados, A.M. Efstathiou, J.L.G. Fierro (2006), “Nucleation of Isolated  $PO_4$  Units on  $CeO_2$  Driven by High Temperatures and the Effect on its Oxygen Storage and Release Properties”, 7<sup>th</sup> International Congress on Catalysis and Automotive Pollution Control (CAPoC-7), 29 Aug. – 1 Sept., Brussels, Belgium.
- S.Y. Christou, A.M. Efstathiou (2006), “Effects of Pd Particle Size on the Rates of Oxygen Back-Spillover and CO Oxidation under Dynamic Oxygen Storage and Release Measurements over Pd/ $CeO_2$  Catalysts”, 7<sup>th</sup> International Congress on Catalysis and Automotive Pollution Control (CAPoC-7), 29 Aug. – 1 Sept., Brussels, Belgium.
- S.Y. Christou, A.M. Efstathiou (2006), “Efficient in-Situ Regeneration Method of the Catalytic Activity of Aged TWC”, 7<sup>th</sup> International Congress on Catalysis and Automotive Pollution Control (CAPoC-7), 29 Aug. – 1 Sept., Brussels, Belgium.
- P.G. Savva, V. Ryzhkov, K. Polychronopoulou, A.M. Efstathiou (2006), “Short Multi Wall Nanotubes as Catalysts Supports”, International Meeting on the Chemistry of Nanotubes: Science and Applications (ChemOnTubes), April 2-5, Arcachon, France.
- K. Polychronopoulou, A.M. Efstathiou (2005), “New Aspects of the Hydrogen Production by Steam Reforming of Phenol over Supported-Rh Catalysts”, 2<sup>nd</sup> European Hydrogen Energy Conference (2<sup>nd</sup> EHEC), November 22-25, Zaragoza (Spain).
- C.N. Costa, A.M. Efstathiou (2005), “A Green Lean De- $NO_x$  Catalytic Technology for Stationary and Mobile Applications”, European Congress on Catalysis-VII (EUROPACAT-VII), 28 Aug. – 1 Sept., Sofia, Bulgaria.
- C.N. Costa, A.M. Efstathiou (2004), “The Mechanism of Reduction of NO by  $H_2$  in Strongly Oxidizing Conditions (Lean de- $NO_x$ ) on Supported-Pt Catalysts: Effects of Support Chemical Composition and Pt Particle Size”, 13<sup>th</sup> International Congress on Catalysis, 11-16 July, Paris, France.

P.G. Savva, C.N. Costa, V.A. Ryzhkov, A.M. Efstathiou (2004), "Hydrogen Production by Ethylene Decomposition over Ni Supported on Novel Carbon Nanotubes and Carbon Nanofibers", CarboCat-1, June, Lausanne, Switzerland.

C.N. Costa, A.M. Efstathiou (2004), "A Highly Active, Selective and Stable Pt/Mg-Ce-O Catalyst for the NO/H<sub>2</sub>/O<sub>2</sub> (Lean De-NO<sub>x</sub>) Reaction", H<sub>2</sub>-AGE: When, Where, Why, May 16-19, Pisa, Italy.

K. Polychronopoulou, Z.I. Theodorou, C.N. Costa, A.M. Efstathiou (2004), "Hydrogen Production by Steam Reforming of Phenol over Novel Supported-Rh and Fe Catalysts", H<sub>2</sub>-AGE: When, Where, Why, May 16-19, Pisa, Italy.

S.Y. Christou, C.N. Costa, A.M. Efstathiou (2003), "A Two-Step Reaction Mechanism of Oxygen Release from Pd/CeO<sub>2</sub>: Mathematical Modeling based on Step Gas Concentration Experiments", 6<sup>th</sup> International Congress on Catalysis and Automotive Pollution Control (CAPoC-6), 22-24 October, Brussels, Belgium.

C.N. Costa, V.N. Stathopoulos, V.C. Belessi, T.V. Bakas, P.J. Pomonis, A.M. Efstathiou (2001), "Highly Active and Selective Pt/La-Ce-Mn-O and Pt/La-Sr-Ce-Fe-O Catalysts for the NO/H<sub>2</sub>/O<sub>2</sub> (lean de-NO<sub>x</sub>) Reaction in the 100-400°C Range", European Congress on Catalysis-V (EUROPACAT-V), September, Limerick, Ireland.

V.N. Stathopoulos, C.N. Costa, P.J. Pomonis, A.M. Efstathiou (2000), "Catalytic Activity of High Surface Area Mesoporous Mn-based Mixed Oxides for Lean NO<sub>x</sub> Reduction", 5<sup>th</sup> International Congress on Catalysis and Automotive Pollution Control (CAPoC5), April 12-14, Brussels, Belgium.

V.N. Stathopoulos, V.C. Belessi, S. Neophytides, P. Falaras, C.N. Costa, A.M. Efstathiou (2000), P.J. Pomonis, "Catalytic Activity of High Surface Area Mesoporous Mn-based Mixed Oxides for the Deep Oxidation of Methane and Lean-NO<sub>x</sub> Reduction", 12<sup>th</sup> International Congress on Catalysis, July, Granada, Spain.

P. Szedlaczek, A.M. Efstathiou (1998), "A Novel Mathematical Analysis of Equilibrium Adsorption and Desorption Using Transient Isotopic Techniques: Elucidation of True Surface Heterogeneity", Effects of Surface Heterogeneity in Adsorption and Catalysis on Solids", August, Torun, Poland.

P. Szedlaczek, A.M. Efstathiou (1997), X.E. Verykios, "A Novel Mathematical Analysis of Equilibrium Adsorption and Desorption Using Transient Isotopic Techniques", European Congress on Catalysis-III (EUROPACAT-III), Aug. 31-Sept. 6, Krakow, Poland.

### **Presentations in Greek Conferences (Oral/Poster)**

There are **17 Oral** and **18 Poster (2 Awards)** presentations in Panhellenic Symposia on Catalysis, and **2 Oral** presentations in Greece-Cyprus Chemistry Conferences.

### **Public Presentations**

March 2004: A Lecture titled "The Catalytic Technology of Gasoline Cars – Management of Aged Commercial Three-Way Catalysts", Zenonion Open University Lecture Series, Larnaka-Cyprus.

November 2003: A Lecture titled "The Catalytic Car in our Present Life", Open University Lecture Series, Nicosia, Cyprus.

June 2003: Presentation in the TV Program: "Line 1088" of the First Patent granted to the University of Cyprus related to the H<sub>2</sub>-SCR technology developed.

February 2001: A Lecture titled "Sources of Atmospheric Pollution and Ways of Facing the Problem", Open University Lecture Series, Nicosia, Cyprus.

### **Professional Societies**

American Chemical Society, 1983 – present; American Institute of Chemical Engineers, 1983 – present; Hellenic Catalysis Society, 1995 – present.

## Publications

### I. Articles in Peer-Reviewed International Journals

#### 1989

1. A.M. Efstathiou, C.O. Bennett, "Surface Species on Rh/Al<sub>2</sub>O<sub>3</sub> during CO/H<sub>2</sub> Reaction Studied by Transient Techniques", *Chem. Eng. Comm.* 83 (1989) 129-146. doi:10.1080/00986448908940658
2. A.M. Efstathiou, C.O. Bennett, "The CO/H<sub>2</sub> Reaction on Rh/Al<sub>2</sub>O<sub>3</sub>. I. Steady-State and Transient Kinetics", *J. Catal.* 120 (1989) 118-136; doi:10.1016/0021-9517(89)90255-8
3. A.M. Efstathiou, C.O. Bennett, "The CO/H<sub>2</sub> Reaction on Rh/Al<sub>2</sub>O<sub>3</sub>. II. Kinetic Study by Transient Isotopic Methods", *J. Catal.* 120 (1989) 137-156; doi:10.1016/0021-9517(89)90256-X

#### 1990

4. A.M. Efstathiou, S.L. Suib, C.O. Bennett, "Encapsulation of Molecular Hydrogen in Zeolites at One Atmosphere", *J. Catal.* 123 (1990) 456-462; doi:10.1016/0021-9517(90)90142-7
5. A.M. Efstathiou, C.O. Bennett, "Enthalpy and Entropy of H<sub>2</sub> Adsorption on Rh/Al<sub>2</sub>O<sub>3</sub> Measured by Temperature-Programmed Desorption", *J. Catal.* 124 (1990) 116-126; doi:10.1016/0021-9517(90)90108-V

#### 1991

6. A.M. Efstathiou\*, "The CO/H<sub>2</sub> Reaction on Rh/MgO Studied by Transient Isotopic Methods", *J. Mol. Catal.* 67 (1991) 229-249; doi:10.1016/0304-5102(91)85049-8
7. A.M. Efstathiou\*, "Temperature-Programmed Desorption (TPD), Reaction (TPR) and Oxidation (TPO) of Species Formed on Rh/MgO After Interaction with H<sub>2</sub> and CO", *J. Mol. Catal.* 69 (1991) 41-60; doi:10.1016/0304-5102(91)80103-A
8. A.M. Efstathiou\*, "The C<sub>2</sub>H<sub>4</sub>/He Reaction on Rh/MgO Studied by Transient Methods", *J. Mol. Catal.* 69 (1991) 105-116; doi:10.1016/0304-5102(91)80107-E
9. A.M. Efstathiou, S.L. Suib, C.O. Bennett, "Transient Diffusion, Sorption and Desorption of Cyclopropane in NaX Zeolite", *J. Catal.* 131 (1991) 94-103; doi:10.1016/0021-9517(91)90326-Y

#### 1992

10. A.M. Efstathiou, S.L. Suib, C.O. Bennett, "Transient Diffusion, Desorption and Reaction Studies of Cyclopropane and Propylene with NaX and Eu/NaX Zeolites", *J. Catal.* 135 (1992) 223-235; doi:10.1016/0021-9517(92)90281-L
11. A.M. Efstathiou, S.L. Suib, C.O. Bennett, "Transient Sorption and Desorption Studies of Cyclopropane and Propylene with Cs/NaX and Ni/NaX Zeolites", *J. Catal.* 135 (1992) 236-245. doi:10.1016/0021-9517(92)90282-M
12. A.M. Efstathiou, E. Borgstedt, S.L. Suib, C.O. Bennett, "Encapsulation of Molecular Hydrogen in Ion-Exchanged A Zeolites at 1 Atm", *J. Catal.* 135 (1992) 135-146; doi:10.1016/0021-9517(92)90275-M
13. M.W. Simon, A.M. Efstathiou, C.O. Bennett, S.L. Suib, "Cyclopropane Isomerization over Eu/NaX Zeolites", *J. Catal.* 138 (1992) 1-11; doi:10.1016/0021-9517(92)90002-Y
14. A.M. Efstathiou, D. Boudouvas, N. Vamvouka, X.E. Verykios, "Kinetics of Methane Oxidative Coupling on Zinc-Doped Titanium Oxide", *Appl. Catal. A: Gen.* 92 (1992) 1-15. doi:10.1016/0926-860X(92)80275-H

#### 1993

15. A.M. Efstathiou, T. Chafik, D. Bianchi, C.O. Bennett, "In Situ Determination of Surface Carbon Species Formed on Rh/Al<sub>2</sub>O<sub>3</sub> During CO/H<sub>2</sub> Reaction by Using Various Transient and Isotopic Methods", *Stud. Surf. Sci. Catal.* 75 (1993) 1563-1566; doi:10.1016/S0167-2991(08)64480-8
16. H. Halafi, E. Borgstedt, A.M. Efstathiou, S.L. Suib, D. Bianchi, "Hydrogen Surface Concentration Effect on the Temperature-Programmed Hydrogenation of Adsorbed Carbonaceous Species on an Fe/Al<sub>2</sub>O<sub>3</sub> Catalyst", *Stud. Surf. Sci. Catal.* 75 (1993) 2499-2502; doi:10.1016/S0167-2991(08)64334-7



17. P. Szedlacsek, A.M. Efstathiou, C.O. Bennett, S.L. Suib, "Adsorption Study by Transient Methods. Theory and Modeling", *Stud. Surf. Sci. Catal.* 75 (1993) 1559-1562; doi:10.1016/S0167-2991(08)64479-1
18. A.M. Efstathiou, D. Boudouvas, N. Vamvouka, X.E. Verykios, "Kinetics of Methane Oxidative Coupling on Li<sup>+</sup>-Doped TiO<sub>2</sub> Catalysts", *J. Catal.* 140 (1993) 1-15 doi:10.1006/jcat.1993.1064
19. A.M. Efstathiou, B.J. Tan, S.L. Suib, "CO-Induced Changes in the Oxidation State of Rhodium Supported on MgO: X-Ray Photoelectron Spectroscopic Study", *J. Catal.* 140 (1993) 564-574; doi:10.1006/jcat.1993.1106
20. A.M. Efstathiou, D. Papageorgiou, X.E. Verykios, "Transient Kinetic Study of the Reaction of CH<sub>4</sub> and C<sub>2</sub>H<sub>6</sub> with the Lattice Oxygen of Li<sup>+</sup>-Doped TiO<sub>2</sub> Catalyst", *J. Catal.* 141 (1993) 612-627; doi:10.1006/jcat.1993.1168
21. A.M. Efstathiou, D. Papageorgiou, X.E. Verykios, "The Role of Lattice Oxygen During the Oxidative Coupling of Methane over Li<sup>+</sup>-Doped TiO<sub>2</sub> Catalysts", *J. Catal.* 144 (1993) 352-357. doi:10.1006/jcat.1993.1336

## 1994

22. A.M. Efstathiou, T. Chafik, D. Bianchi, C.O. Bennett, "CO Chemisorption and Hydrogenation of Surface Carbon Species Formed After CO/He Reaction on Rh/MgO: A Transient Kinetic Study Using FTIR and Mass Spectroscopy", *J. Catal.* 147 (1994) 24-37; doi:10.1006/jcat.1994.1111
23. D. Papageorgiou, A.M. Efstathiou, X.E. Verykios, "Transient Kinetic Study of the Reaction of C<sub>2</sub>H<sub>4</sub> and C<sub>2</sub>H<sub>6</sub> with the Lattice and Adsorbed Oxygen Species of Li<sup>+</sup>-Doped TiO<sub>2</sub> Catalysts", *J. Catal.* 147 (1994) 279-293; doi:10.1006/jcat.1994.1139
24. D. Papageorgiou, A.M. Efstathiou, X.E. Verykios, "The Selective Oxidation of Methane to C<sub>2</sub>-Hydrocarbons over Lithium-Doped TiO<sub>2</sub> Catalysts", *Appl. Catal. A: Gen.* 111 (1994) 41-62. doi:10.1016/0926-860X(94)80066-9
25. A.M. Efstathiou, T. Chafik, D. Bianchi, C.O. Bennett, "A Transient Kinetic Study of the CO/H<sub>2</sub> Reaction on Rh/Al<sub>2</sub>O<sub>3</sub> Using FTIR and Mass Spectrometry", *J. Catal.* 148 (1994) 224-239. doi:10.1006/jcat.1994.1204
26. A.M. Efstathiou, S. Lacombe, C. Mirodatos, X.E. Verykios, "A Steady-State Tracing Kinetic Analysis of Oxidative Coupling of Methane over Li<sup>+</sup>-Doped TiO<sub>2</sub>: Mechanistic Aspects of the Carbon and Oxygen Reaction Pathways to Form CO<sub>2</sub>", *J. Catal.* 148 (1994) 639-647; doi:10.1006/jcat.1994.1250
27. A.M. Efstathiou, D. Papageorgiou, X.E. Verykios, "The Selective Oxidation of Methane to C<sub>2</sub>-Hydrocarbons over Li<sup>+</sup>-Doped TiO<sub>2</sub>: Catalytic and Mechanistic Studies", *Stud. Surf. Sci. Catal.* 81 (1994) 217-222; doi:10.1016/S0167-2991(08)63868-9
28. V. Tshipouriari, A.M. Efstathiou, Z.L. Zhang, X.E. Verykios, "Reforming of Methane with Carbon Dioxide to Synthesis Gas over Supported Rh Catalysts", *Catal. Today* 21 (1994) 579-587. doi:10.1016/0920-5861(94)80182-7

## 1995

29. A.M. Efstathiou\*, K. Fliatoura, "Selective catalytic reduction of nitric oxide with ammonia over V<sub>2</sub>O<sub>5</sub>/TiO<sub>2</sub> catalyst: A steady-state and transient kinetic study", *Appl. Catal. B: Environ.* 6 (1995) 35-59; doi:10.1016/0926-3373(94)00062-X
30. T. Ioannides, A.M. Efstathiou, Z.L. Zhang, X.E. Verykios, "CO Oxidation Over Rh Dispersed on SiO<sub>2</sub>, Al<sub>2</sub>O<sub>3</sub>, and TiO<sub>2</sub>: Kinetic Study and Oscillatory Behaviour", *J. Catal.* 156 (1995) 265-272; doi:10.1006/jcat.1995.1253

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## II. Chapters in Books

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Note: Articles No. **55, 72, 83, 94, and 107** were ranked by Elsevier in the “**Top 25 Hottest Articles**”.

## III. Patents

**A.M. Efstathiou**, C.N. Costa and J.L.G. Fierro

“A Novel Stable, Active and Selective Catalyst for NO Reduction to N<sub>2</sub> with the use of Hydrogen under Lean De-NO<sub>x</sub> Conditions”

1. Spanish Patent ES 2 192 985 B1 (2005)
2. US 7,105,137 B2 (2006)
3. EP 03704721 (2008)

**A.M. Efstathiou**, P.G. Savva and C.N. Costa

“Catalyst Containing Platinum and Palladium for the Selective Reduction of NO<sub>x</sub> with Hydrogen (H<sub>2</sub>-SCR)”

4. US 8,114,369 B2 (2012)

K. Polychronopoulou, A.G. S. Hussien, **A.M. Efstathiou**, C.M. Damaskinos

“Ceria-Supported Catalyst”

5. US 17/900,374 (application filed on 31 Aug. 2022).

## Scientific Metrics (by December 27, 2023)

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**Table 1: Quantitative and Qualitative Indicators of Scientific Publications  
(Scopus/Google Scholar)**

Indicator	Scopus	Google Scholar
<b>Total Publications (papers)</b>	<b>171</b>	<b>177</b>
<b>Total Citations</b>	<b>7665</b>	<b>9634</b>
<b>Average citations / publication</b>	44.8	54.4
<b>h - index</b>	<b>53</b>	<b>60</b>
<b>i10 - index</b>	138	145
<b>Percent of documents in the <u>top 25% journals</u> by CiteScore</b>	<b>86.5</b>	-
<b>Percent of documents in the <u>top 25% most</u> <u>cited documents worldwide</u></b>	<b>74.1</b>	-
<b>Avg Impact Factor*</b>	<b>~ 9.5</b>	n.d.
<b>Publications with Corresponding Authorship</b>	125 (70%)	130 (73%)

\*Avg Impact Factor = Total Impact Factor / Total Number of Publications in Journals with reported IF;

Total Impact Factor =  $\sum (IF_i \times N_i)$

$IF_i$  : Impact Factor of Journal i;  $N_i$  : number of publications in Journal i.