HELLENIC REPUBLIC
National and Kapodistrian University of Athens
EST. 1837

# DEPARTMENT OF CHEMISTRY


**Georgios Papadogianakis**
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**EDUCATION**:

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| 1987 | Diplom in Chemistry, Aachen University of Technology (RWTH Aachen), Germany |
| 1990 | Ph.D., RWTH Aachen, Institute of Industrial Chemistry and Petrolchemistry in cooperation and exclusively financed by the Hoechst AG Werk Ruhrchemie Company for the development of a novel industrial process for the hydroformylation of higher olefins employing water-soluble surface active transition metal catalytic complexes in environmentally friendly micellar aqueous/organic two-phase systems |
| 5/1992 - 7/1993 | Post-doctoral Researcher in Institute of Industrial Chemistry and Petrolchemistry, RWTH Aachen |
| 8/1993 - 6/1997 | Post-doctoral Researcher with Roger A. Sheldon, Delft University of Technology, Laboratory of Organic Chemistry and Catalysis, The Netherlands, in the field of catalytic conversions of renewable biomass-derived carbohydrates and their platform chemicals employing water-soluble transition metal catalytic complexes in environmentally friendly, green and sustainable aqueous media |

**PROFESSIONAL EMPLOYMENT**:

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| 4/1987 - 10/1990 & 5/1992 - 7/1993 | Scientific Assistant, RWTH Aachen, Institute of Industrial Chemistry and Petrolchemistry |
| 8/1994 - 6/1997 | Researcher, Delft University of Technology, Laboratory of Organic Chemistry and Catalysis |
| 7/1997 - 10/2000 | Assistant Professor, National and Kapodistrian University of Athens, Department of Chemistry, Laboratory of Industrial Chemistry, Greece |
| 10/2000 - 2/2010 | Tenured Assistant Professor, National and Kapodistrian University of Athens, Department of Chemistry, Laboratory of Industrial Chemistry, Greece |
| 2/2010 - 2/2019 | Associate Professor, National and Kapodistrian University of Athens, Department of Chemistry, Laboratory of Industrial Chemistry, Greece |
| 2/2019 - present | Professor, National and Kapodistrian University of Athens, Department of Chemistry, Laboratory of Industrial Chemistry, Greece |

**HONOURS & AWARD**:

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| 1979 - 1984 | Scholarship of the Dr. Jost Henkel Stiftung, Henkel KGaA Company, Germany, due to excellent results in the undergraduate studies |
| 1985 - 1986 | Scholarship of the DAAD (Deutscher Akademischer Austausch Dienst) |
| 8/1993 - 7/1994 | Fellowship of the Dutch National Innovation Oriented Programme on Catalysis (IOP-k) for the catalytic conversion of carbohydrates in aqueous media |
| 1996 | Award of Cambridge Isotope Laboratories (CIL), Massachusetts, USA, 5l of labelled $^{13}CO$ (99%) in the 2$^{nd}$ Worldwide CIL Research Grand Programme |
| 7/1998 - 8/1998 | Fellowship of the Delft University of Technology for research activities at Laboratory of Organic Chemistry and Catalysis in Delft, NL |

7/1999 - 8/1999 Fellowship of the Royal Society of Chemistry, U.K., for research activities at Laboratory of Organic Chemistry and Catalysis in Delft, NL

7/2000 - 8/2000 Fellowship of the Delft University of Technology for research activities at Laboratory of Organic Chemistry and Catalysis in Delft, NL

**RESEARCH INTERESTS / ACTIVITIES**:

- Catalysis in homogeneous and aqueous/organic two-phase systems in a broad spectrum of catalytic industrially relevant reactions especially catalytic conversions of natural biomass based renewable resources such as carbohydrates, vegetable/tropical oils and their derivatives as well as various renewable and sustainable platform chemicals
- Micellar catalysis
- Design and synthesis of novel highly active and selective organic- and water-soluble transition- and main-group metal catalytic complexes and water-dispersible metal(0) catalytic nanoparticles
- Mechanistic investigations of catalytic reactions
- Development of novel catalytic industrially relevant processes
- Catalysis for biorefineries to produce advanced biofuels, biobased chemicals, energy/power, food, pharmaceuticals and materials
- Green/Sustainable Chemistry

**TEACHING ACTIVITIES**

**Undergraduate courses**:

- Industrial Chemical Processes
- Petroleum and Petrochemical Chemistry and Technology

**Postgraduate courses**:

- Catalysis: Principles and Industrial Applications
- Environmentally friendly Chemistry: Biphasic Catalysis
- Applied Catalysis in Biorefineries

**EDITORIAL POSITIONS**

- "*Frontiers in Chemistry*" Section "*Green and Sustainable Chemistry*" Associate Editor (April 2022-)
- "*Catalysts*" Section "*Biomass Catalysis*" Member of the Topical Advisory Panel (August 2022-)
- "*Catalysis Research*" Member of the Editorial Board (September 2021-)

**OTHER ACTIVITIES**:

- Managing Guest Editor for a Special Issue on "*Recent Advances in Catalysis in Green Aqueous Media*" of *Catalysis Today*, Volume 247 (2015) Pages 1-190 edited by Georgios Papadogianakis and Roger A. Sheldon with 22 papers.
- Guest Editor for the Research Topic "*Aqueous-phase Catalytic Conversions of Renewable Feedstocks for Sustainable Biorefineries*" of *Frontiers in Chemistry*, Section "*Green and Sustainable Chemistry*" E-Book (ISBN 978-2-88966-447-4) (2020) Pages 1-210 edited by Georgios Papadogianakis, Roger Arthur Sheldon, Yulong Wu and Dmitry Yu. Murzin with 15 articles.
- Director of the Postgraduate Studies Programme "*Catalysis and its Applications in the Industry*" of the Department of Chemistry, National and Kapodistrian University of Athens, 09/2004 - present. The first title of this Postgraduate Studies Programme was "*Catalysis an Integrated Approach*" from September 2004 - August 2008. Source of funding: EPEAEK II Programme of Greek Ministry of Education and the European Union (75/25) and from September 2008 - August 2011: Greek Ministry of Education. The Postgraduate Studies Programme "*Catalysis an Integrated Approach*" was organized since the academic year 2004 - 2005 in the Department of Chemistry of National and Kapodistrian University of Athens in collaboration with the Centre for Research and Technology Hellas (CERTH) in Thessaloniki and the Kavala Institute of Technology, Department of Petroleum and Natural Gas and in cooperation with Professors of the Departments of Chemical Engineering of both the University of Patras and the Aristotle University of Thessaloniki, the School of Chemical Engineering of the National Technical University of Athens, the Department of Mechanical Engineering of the Aristotle University of Thessaloniki and the Department of Chemistry of the University of Ioannina. Catalysis is an interdisciplinary field which combines high quality exciting science and engineering with a unique potential to contribute to environmentally and economically sustainable technologies which is reflected in this Postgraduate Studies

Programme and allows students to focus on the three delineated areas of catalysis *i.e.* homogeneous-, heterogeneous- and bio-catalysis in their basics in the first semester and in one area in the second semester. The degree of Master of Science (MSc) in Catalysis was awarded for one year's study assessed by exams and for one year's research. Since 2011 the duration to obtain the degree of MSc in Catalysis is a semester shorter namely with a total duration of one and half year. From September 2016 this program is financed by registration fees from the postgraduate students. Since September 2017 this Postgraduate Studies Programme is revised, enlarged and updated with a new title "*Catalysis and its Applications in the Industry*" with addition of a new course on "*Applied Catalysis in Biorefineries*". Since September 2018 the Postgraduate Studies Programme "*Catalysis and its Applications in the Industry*" was re-established by Greek Ministry of Education according to the new law for Postgraduate Studies Programmes in Greece.

- Scientist in Charge in 14 Research Projects
- 33 talks in International and National Conferences, Universities, Research Institutes and in Workshops
- Supervisor for 38 Diploma Theses, 23 Masters of Science (MSc) Theses and 1 Ph.D. Thesis

**MAJOR ACCOMPLISHMENTS**

**Research expeditions as leader**:

- Research project exclusively financed by the industrial company Cognis GmbH (today BASF) entitled "*Hydrogenation of methyl ester to fatty alcohol by homogenous catalysis using two-phase technique*" on the biphasic hydrogenolysis of renewable palm kernel and coconut oil methyl esters into their corresponding fatty alcohols and applied a few thousands water-soluble catalytic systems from January 2008 up to December 2011.
- Development of a new process for the aqueous-phase hydrogenation of the key biorefinery platform chemical levulinic acid into γ-valerolactone employing highly active, selective and stable water-soluble ruthenium and platinum catalysts modified with nitrogen-containing ligands and stable water-dispersible ruthenium catalytic nanoparticles
- Development of a novel biphasic process for the partial hydrogenation of edible oils with a low *trans*-fats content using as model compounds polyunsaturated fatty acid methyl esters (FAME) of linseed oil and applying water-soluble Pt/TPPTS catalytic complexes [TPPTS= $P(C_6H_4$-*m*-$SO_3Na)_3$] in aqueous/organic two-phase systems.
- Development of a novel biphasic catalytic process for the selective hydrogenation of renewable polyunsaturated FAME of linseed, sunflower, soybean, rapeseed oils and *Cynara cardunculus* oils into monounsaturated (C18:1) esters catalyzed by water-soluble transition metal complexes in aqueous/organic two-phase system which is of great interest in the fields of production of high quality $1^{st}$ generation biodiesel fuel and of biolubricants and possesses a great potential for the production of $2^{st}$ generation biodiesel fuel.
- Development of a novel catalytic process for the hydrogenation of FAME catalyzed by transition metal complexes modified with sulfonated phosphites which exhibit much higher catalytic activity compared with conventional phosphites or even phosphines in organic monophasic systems.
- Research project on the development of a novel and highly efficient process for the hydrogenation of aromatic compounds such as benzene and dimer fatty acids containing aromatic units catalyzed by water-soluble transition metal TPPTS complexes in aqueous/organic two-phase systems which is of great interest in the fields of production of cyclohexane used for manufacturing nylon 6 and nylon 6.6 (about 90% of all polyamides) and hydrogenated dimer fatty acids which are ideal raw materials for lubricants, cosmetics and plastic additives possessing excellent thermal and oxidation resistance.
- Development of a novel hydrogenation reaction of unsaturated polymers such as polybutadiene-1,4-block-poly(ethylene oxide) and the completely water-insoluble heavy polybutadiene catalyzed by water-soluble Rh/TPPTS complexes in single aqueous and micellar aqueous/organic two-phase systems formed by conventional surfactants.

**Major early contributions as researcher**:

- During the early career research activities at Institute of Industrial Chemistry and Petrolchemistry, Aachen University of Technology (RWTH Aachen) in cooperation and exclusively financed by the Hoechst AG Werk Ruhrchemie Company on the development of a new industrial process for the hydroformylation of higher olefins employing water-soluble surface active transition metal catalytic complexes in micellar aqueous/organic two-phase systems developed a novel class of compounds, namely surfactant phosphines which combine both the properties of a ligand and a surface active agent in one molecule and successfully applied to micellar rhodium-catalyzed hydroformylation of higher olefins in aqueous/organic two-phase systems. Nowadays, this work [B. Fell, G. Papadogianakis, *J. Mol. Catal.* 66 (1991) 143-154, (Citations: 167)] is already regarded as a classical approach to convert apolar, heavier

organic compounds in the polar aqueous medium using water-soluble surface active transition metal catalytic complexes and numerous surfactant phosphines have been developed from various research groups worldwide to modify transition metal complexes for efficient micellar catalysis in a broad spectrum of reactions carried out in aqueous/organic two-phase systems.

- Developed a novel class of ligands, the sulfonated phosphites, which are much more stable to hydrolysis than conventional phosphites. Rhodium catalytic complexes modified with sulfonated phosphites exhibit much higher catalytic activity in the hydroformylation of olefins compared with conventional phosphites or phosphines even at low temperatures and low partial pressures.
- Developed the first catalytic carbonylation reaction of the water-soluble $C_6$ platform chemical HMF using water-soluble transition metal TPPTS complexes namely $Pd(TPPTS)_3$ in completely aqueous medium which may yield a new route to high-value biobased chemicals from renewable resources.
- Developed a novel and more efficient route to the synthesis of the water-soluble catalytic complex $Pd(TPPTS)_3$ and applied for the first time the $^{17}O$-NMR spectroscopy in mechanistic studies of water-soluble catalytic complexes in aqueous medium.
- Developed novel carbonylation and hydrocarboxylation reactions for the synthesis of carboxylic acids such as the non-steroidal antiinflammatory pharmaceutical ibuprofen as well as copolymerization reactions of CO with olefins to produce perfectly alternating polyketones using water-soluble palladium catalytic complexes in completely aqueous and aqueous/organic two-phase systems. The water-soluble $Pd(TPPTS)_3$ catalyst exhibited much higher catalytic activity in the biphasic hydrocarboxylation reaction of lower olefins than their conventional counterparts which contrasts with the general perception that aqueous/organic two-phase catalysis normally exhibits lower rates compared to analogous reactions in conventional organic media.
- Developed a novel aqueous-phase hydrogenation of renewable $C_6$ carbohydrates such as fructose and the polysaccharide inulin (contains one glucose and 10 to 50 fructose units) catalyzed by water-soluble Ru/TPPTS complexes in aqueous media which may yield a new and attractive route to valuable mannitol from inulin.
- Developed a novel Wacker-type oxidation reaction of α-olefins to 2-alkanones catalyzed by water-soluble palladium modified with N-containing ligands by air in aqueous/organic two- phase systems.

**REFEREE IN JOURNALS**

- *Applied Catalysis B: Environmental*
- *Catalysis Today*
- *Applied Catalysis A: General*
- *Journal of Molecular Catalysis A: Chemical* (today: *Molecular Catalysis*)
- *Molecules*
- *Energy & Fuels*
- *Reaction Kinetics, Mechanisms and Catalysis*
- *Catalysis Communications*
- *Reactive and Functional Polymers*
- *European Polymer Journal*
- *Industrial Crops and Products*
- *Frontiers in Chemistry*
- *Catalysts*
- *New Journal of Chemistry*

**REFEREE IN EUROPEAN RESEARCH PROGRAMS**

Referee in the evaluation process of the European Program COST (*European Cooperation in Science and Technology*) on the proposal of the Working Group "*Green Chemistry through Aqueous Organometallic Catalysis*" for the COST ACTION D29 entitled "*Green/Sustainable Chemistry and Chemical Technology*"

**MEMBER OF INTERNATIONAL EXAMINATION COMMITTEES FOR Ph.D. THESES**

- 2/2001: Member of the 8$^{th}$-membered international examination committee of the Delft University of Technology in the defence of G. Verspui on the Ph.D. thesis entitled "*Catalytic carbonylation reactions in aqueous media*"
- 12/2001: Member of the 8$^{th}$-membered international examination committee of the Delft University of Technology in the defence of G.-J. ten Brink on the Ph.D. thesis entitled "*Green catalytic oxidations*"

**REFEREE IN THE 7th EUROPEAN CONGRESS ON CATALYSIS (EUROPACAT - VII):**
Referee in submitted works for oral and poster presentations in the 7th European Congress on Catalysis (EuropaCat - VII), 28/8-1/9/2005, Sofia, Bulgaria, organized by the Bulgarian and Greek Catalysis Societies

**MEMBER OF THE SCIENTIFIC COMMITTEE ON THE 8th PANHELLENIC SYMPOSIUM ON CATALYSIS**
Member of the scientific committee of the 8th Panhellenic Symposium on Catalysis entitled "*Catalysis and Renewable Resources*", 30/10-1/11/2004, Agia Napa, Cyprus, organized by the Greek Catalysis Society

## LIST OF PUBLICATIONS

### A. IN JOURNALS

1. B. Fell, G. Papadogianakis, *J. Mol. Catal.* 66 (1991) 143-154.
2. B. Fell, G. Papadogianakis, W. Konkol, J. Weber, H. Bahrmann, *J. Prakt. Chem./Chem.-Ztg.* 335 (1993) 75-82.
3. B. Fell, G. Papadogianakis, *J. Prakt. Chem./Chem.-Ztg.* 336 (1994) 591-595.
4. W. Makropoulos, G. Papadogianakis, N. Jakobi, F. Schmutzler, *Wiss. Umwelt* 1994 (3/4) 133-138.
5. B. Fell, Ch. Schobben, G. Papadogianakis, *J. Mol. Catal. A: Chem.* 101 (1995) 179-186.
6. S. Kanagasabapathy, Z. Xia, G. Papadogianakis, B. Fell, *J. Prakt. Chem./Chem.-Ztg.* 337 (1995) 446-450.
7. G. Papadogianakis, L. Maat, R.A. Sheldon, *J. Chem. Soc., Chem. Commun.* 1994, 2659-2660.
8. G. Papadogianakis, J.A. Peters, L. Maat, R.A. Sheldon, *J. Chem. Soc., Chem. Commun.* 1995, 1105-1106.
9. G. Papadogianakis, R.A. Sheldon, *New J. Chem.* 20 (1996) 175-185.
10. G. Papadogianakis, L. Maat, R.A. Sheldon, *J. Mol. Catal. A: Chem.* 116 (1997) 179-190.
11. G. Papadogianakis, L. Maat, R.A. Sheldon, *J. Chem. Technol. Biotechnol.*70 (1997) 83-91.
12. G. Papadogianakis, G. Verspui, L. Maat, R.A. Sheldon, *Catal. Lett.* 47 (1997) 43-46.
13. G. Papadogianakis, R.A. Sheldon, *Catalysis, Specialist Periodical Reports, Royal Society of Chemistry, Vol.* 13 (1997) 114-193.
14. G. Verspui, G. Papadogianakis, R.A. Sheldon, *Catal. Today* 42 (1998) 449-458.
15. G. Verspui, G. Papadogianakis, R.A. Sheldon, *Chem. Commun.* 1998, 401-402.
16. G. Papadogianakis, L. Maat, R.A. Sheldon, *Inorg. Synth.* 32 (1998) 25-29.
17. G.-J. ten Brink, I.W.C.E. Arends, G. Papadogianakis, R.A. Sheldon, *Chem. Commun.* 1998, 2359-2360.
18. A.W. Heinen, G.Papadogianakis, R.A. Sheldon, J.A. Peters, H. van Bekkum, *J. Mol. Catal. A: Chem.* 142 (1999) 17-26.
19. G. Verspui, J. Feiken, G. Papadogianakis, R.A. Sheldon, *J. Mol. Catal. A: Chem.* 146 (1999) 299-307.
20. G.-J. ten Brink, I.W.C.E. Arends, G. Papadogianakis, R.A. Sheldon, *Appl. Catal. A: Gen.* 194-195 (2000) 435-442.
21. G. Verspui, G. Elbertse, G. Papadogianakis, R.A. Sheldon, *J. Organomet. Chem.* 621 (2001) 337-343.
22. V. Kotzabasakis, E. Georgopoulou, M. Pitsikalis, N. Hadjichristidis, G. Papadogianakis, *J. Mol. Catal. A: Chem.* 231 (2005) 93-101.
23. A. Bouriazos, K. Mouratidis, N. Psaroudakis, G. Papadogianakis, *Catal. Lett.* 121 (2008) 158-164.
24. N. Nikolaou, C.E. Papadopoulos, A. Lazaridou, A. Koutsoumba, A. Bouriazos, G. Papadogianakis, *Catal. Commun.* 10 (2009) 451-455.
25. V. Kotzabasakis, N. Hadjichristidis, G. Papadogianakis, *J. Mol. Catal. A: Chem.* 304 (2009) 95-100.
26. N.C. Kokkinos, A. Lazaridou, N. Nikolaou, G. Papadogianakis, N. Psaroudakis, A.K. Chatzigakis, C.E. Papadopoulos, *Appl. Catal. A: Gen.* 363 (2009) 129-134.
27. A. Bouriazos, S. Sotiriou, C. Vangelis, G. Papadogianakis, *J. Organomet. Chem.* 695 (2010) 327-337.
28. C. Vangelis, A. Bouriazos, S. Sotiriou, M. Samorski, B. Gutsche, G. Papadogianakis, *J. Catal.* 274 (2010) 21-28.
29. A. Bouriazos, E. Ikonomakou, G. Papadogianakis, *Ind. Crops Prod.* 52 (2014) 205-210.
30. A. Bouriazos, S. Sotiriou, P. Stathis, G. Papadogianakis, *Appl. Catal. B: Environ.* 150-151 (2014) 345-353.
31. Ch. Vasiliou, A. Bouriazos, A. Tsichla, G. Papadogianakis, *Appl. Catal. B: Environ.* 158-159 (2014) 373-381.
32. A. Bouriazos, Ch. Vasiliou, A. Tsichla, G. Papadogianakis, *Catal. Today* 247 (2015) 20-32.
33. G. Papadogianakis, R.A. Sheldon, *Catal. Today* 247 (2015) 1-3.
34. P. Stathis, D. Stavroulaki, N. Kaika, K. Krommyda, G. Papadogianakis, *Appl. Catal. B: Environ.* 209 (2017) 579-590.
35. Ch. Moustani, E. Anagnostopoulou, K. Krommyda, Ch. Panopoulou, K.G. Koukoulakis, E.B. Bakeas, G. Papadogianakis, *Appl. Catal. B: Environ.* 238 (2018) 82-92.

36. N. Kaika, Ch. Panopoulou, E. Anagnostopoulou, Ch. Fakas, P. Lilas, D. Stavroulaki, G. Papadogianakis, *Catal. Lett*. 149 (2019) 580-590.
37. K. Krommyda, Ch. Panopoulou, Ch. Moustani, E. Anagnostopoulou, K. Makripidi, G. Papadogianakis, *Catal. Lett*. 149 (2019) 1250-1265.
38. A. Seretis, P. Diamantopoulou, I. Thanou, P. Tzevelekidis, Ch. Fakas, P. Lilas, G. Papadogianakis, *Front. Chem.* 8 (2020) 221, doi: 10.3389/fchem.2020.00221.
39. G. Papadogianakis, R.A. Sheldon, D.Yu. Murzin, Y. Wu, *Front. Chem.* 8 (2020) 629578, doi: 10.3389/fchem.2020.629578.
40. G. Papadogianakis, R.A. Sheldon, Y. Wu, D.Yu. Murzin, *Front. Chem.* E-Book (2020) pp. 1-210 with 15 articles, ISBN 978-2-88966-447-4, doi: 10.3389/978-2-88966-447-4.
41. E. Anagnostopoulou, P. Lilas, P. Diamantopoulou, Ch. Fakas, I. Krithinakis, E. Patatsi, E. Gabrielatou, A.P. van Muyden, P.J. Dyson, G. Papadogianakis, *Renew. Energy* 192 (2022) 35-45.

| **Journal Title** | **Impact Factor (Clarivate Analytics, 2022)** |
|---|---|
| Appl. Catal. B: Environ. | 24.319 |
| Renew. Energy | 8.634 |
| J. Catal. | 8.047 |
| Catal. Today | 6.562 |
| Ind. Crops Prod. | 6.449 |
| J. Chem. Soc., Chem. Commun., Today: Chem. Commun. | 6.065 |
| J. Prakt. Chem./Chem.-Ztg., Today: Adv. Synth. Catal. | 5.981 |
| Appl. Catal. A: Gen. | 5.723 |
| Front. Chem. | 5.545 |
| J. Mol. Catal. A: Chem., Today: Mol. Catal. | 5.089 |
| J. Chem. Technol. Biotechnol. | 3.709 |
| Catal. Commun. | 3.510 |
| Catal. Lett. | 2.936 |
| New J. Chem. | 3.925 |
| Recl. Trav. Chim. Pays-Bas., Today: Eur. J. Org. Chem. and Eur. J. Inorg. Chem. | 3.261 and 2.551 |
| J. Organomet. Chem. | 2.345 |
| Catalysis, Specialist Periodical Reports | Book series of Royal Society of Chemistry |
| Inorg. Synth. | Book series of John Wiley & Sons, Inc. |

**B. PATENTS**

1. H. Bahrmann, B. Fell, G. Papadogianakis, *DE 3 942 787 B1* (1989), *EP 0 435 071 B1* (1990), *US 632 465* (1990), *US 5 126 475* (1992), *CA 2 032 371* (1990), *JP Hei/2/402 868* (1990), *AU 68 368/90* (1990), *BR 90 06 501* (1991), *TW 79/109 500* (1990), *KO 90/20 650* (1990) to Hoechst AG.
2. H. Bahrmann, B. Fell, G. Papadogianakis, *DE 3 942 954 B1* (1989), *EP 0 435 084 B1* (1990), *US 632 464* (1990), *US 5 118 867* (1992), CA 2 032 372 (1990), *JP Hei/2/402 869* (1990), *AU 68 367/90* (1990), *BR 90 06 444* (1991), *TW 79/109 499* (1990), *KO 90/20 528* (1990) to Hoechst AG.
3. G. Papadogianakis, B. Fell, H. Bahrmann, *DE 9 016 585 U* (1990), *EP 0 489 330 B1* (1991), *DK 489 330 T* (1995) to Hoechst AG
4. R.A. Sheldon, L. Maat, G. Papadogianakis, *US 5 536 874* (1996), *WO 96/26177* (1996) to Hoechst Celanese Corp.
5. G.A. Verspui, G. Papadogianakis, R.A. Sheldon, *NL 1 007 422 (*1997) to Delft University of Technology

6. G. Papadogianakis, A. Bouriazos, K. Mouratidis, N. Psaroudakis, EP 1 918 358 B1 (11.10.2006), US 8 263 794 B2 (11.09.2012), ES 2 391 466 T3 (27.11.2012), WO 2008/043454 A1 (02.10.2007), CA 2 672 680 A1 (17.04.2008) and US 2010/0022664 A1 (28.01.2010) to Cognis IP Management GmbH and National and Kapodistrian University of Athens.
7. G. Papadogianakis, A. Bouriazos, A. Tsichla, C. Vasiliou, *US 8 334 396 B2* (18.12.2012), *EP 2 014 752 A1* (23.06.2007), *WO 2009/000435 A1* (14.06.2008), *US 2010/0234625 A1* (16.09.2010) to Cognis IP Management GmbH and National and Kapodistrian University of Athens.
8. C. Vangelis, S. Sotiriou, A. Yokaris, A. Bouriazos, G. Papadogianakis, *EP 2 179 980 A1* (23.10.2008) to Cognis IP Management GmbH and National and Kapodistrian University of Athens.
9. G. Papadogianakis, A. Bouriazos, *EP 2 426 191 A1* (02.08.2010), *WO 2012/016849 A1* (09.02.2012) to Cognis IP Management GmbH and National and Kapodistrian University of Athens.

**C. CHAPTERS IN BOOKS**

1. G. Papadogianakis, R.A. Sheldon, "*Tenside Ligands*'' in "*Aqueous-Phase Organometallic Catalysis: Concepts and Applications*'' edited by B. Cornils and W.A. Herrmann, Wiley-VCH, Weinheim, 1998, pp.123-134.
2. R.A. Sheldon, G. Papadogianakis, "*Oxidations*'' in "*Aqueous-Phase Organometallic Catalysis: Concepts and Applications*'' edited by B. Cornils and W.A. Herrmann, Wiley-VCH, Weinheim, 1998, pp.506-512.
3. G. Papadogianakis, "*Tenside Ligands*'' in "*Aqueous-Phase Organometallic Catalysis*'' edited by B. Cornils and W.A. Herrmann, Wiley-VCH, Weinheim, 2nd completely revised and enlarged edition, 2004, pp.158-173.

**D. BOOK REVIEWS**

1. G. Papadogianakis, L. Maat, "*Oxygenates by Homologation or CO Hydrogenation with Metal Complexes*'' (Catalysis by Metal Complexes, Vol. 16) edited by G. Braca, Kluwer Academic Publishers, Dordrecht, 1993, *Recl. Trav. Chim. Pays-Bas* 113 (1994) 418.
2. G. Papadogianakis, L. Maat, "*Chemical Nomenclatures and the computer*'' D.J. Polton, John Wiley, Chichester, 1994, *Recl. Trav. Chim. Pays-Bas* 114 (1995) 113.
3. G. Papadogianakis, L. Maat, "*Theoretical Aspects of Homogeneous Catalysis*'' (Catalysis by Metal Complexes, Vol. 18) edited by P.W.N.M. van Leeuwen, K. Morokuma and J.H. van Lenthe, Kluwer Academic Publishers, Dordrecht, 1995, *Recl. Trav. Chim. Pays-Bas* 115 (1996) 383-384.

**E. PAPERS OF OTHERS EXCLUSIVELY DEVOTED TO OUR WORK**

1. J. Haggin, "A carbonylation catalyst that acts in aqueous media may yield new route to commodity chemicals from renewable resources", *Chem. Eng. News* 73 Nr.7 (1995) 38.
2. J. Ross, "Homogeneous Catalysis in Water", *Appl. Catal. A: Gen*. 125 (1995) N8.
3. R. Sakko, "Breakthrough in homogeneous catalysis in water. A novel catalytic carbonylation reaction of alcohol in water was developed (Doorbraak homogene katalyse in water. Nieuwe katalytische carbonylering van alcohol in water ontdekt)", *Chemisch Weekblad*, 1st page, 21st January 1995. Editor of the Dutch weekly publication *Chemisch Weekblad* is the Royal Netherlands Chemical Society (Koninklijke Nederlandse Chemische Vereniging, KNCV).

**CITATIONS: 1621**

**h-index: 25**