# *CURRICULUM VITAE*

# George A. Voyiatzis

**Rio-Patras, October 22, 2021**

## *Contents*

# George A. Voyiatzis

**Research Director / Researcher A'**

Foundation for Research and Technology – Hellas (**FORTH**)
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GR – 264 42 **Patras**
**Greece**

Tel.: +30-2610-453212
Mob. Tel.: +30-6946-066456

*Marital status*: Married,[1] three children;[2] *Date of Birth*: November 17, 1958; *Place of Birth*: **Thessaloniki**; *Native*: **Epanomi**, **Greece**

## *EDUCATION*

**University of Patras**, Patras, Greece (1986 - 1992)
Ph. D., April 1992 (Department of Chemical Engineering)
Thesis Title: "Spectroscopic Investigation of Metal – Metal Halide Molten Mixtures"
Advisor: Professor George N. Papatheodorou

**Université Paris VII**, Paris, France [actually Université Paris Diderot / Paris 7] (1978 - 1983)
Diplôme, Maîtrise de Chimie/Physique, Février 1983
*Option:* Instrumentation *Mention:* Chimie Organique Physique
Diplôme, Licence de Chimie/Physique, Juin 1982
Diplôme d'Etudes Universitaires Générales (D.E.U.G), Juin 1981
*Mention*: Science, *Section*: Sciences des Structures et de la Matière; *Orientation*: Chimie

**Université Paris VI** (Pierre et Marie Curie), Paris, France (1983)
Certificat, Juin 1983 (Module de la Chimie Macromoléculaire Appliquée)

## *RESEARCH INTERESTS*

***Risk Assessment***

- **Migration Control of Nano-Structured Materials Incorporated Biopolymer Packaging**
- **Quantification of the Release of Food Packaging Components into relevant Simulants**

***Circular Economy***

- **Circular Economy through combination of High-Sensitivity Analytical Research Tools**
- **Assessment of the feasibility of Recycling Strategies or Wastes Valorization via Specialty Spectroscopic Probes**

***Specialty Spectroscopic Probes***

- **Development of Flexible Spectro-Probes & Innovative On-Line Monitoring Methods**
- **Non-Invasive Detection of Drugs in the Aqueous Humor of the Eye**
- **Application of an Oscillating Cell and 90º Raman Scattered Light Collection Geometry in Ag/Au Nanocolloidal Solutions for Quantitative SERS Measurements**
- **Quantification of DNA bases and of drugs in corporal fluids**

***Advanced Modified Polymers***

- **Food packaging materials – T-indicators/sensors via spin-cross-over (SCO) phenomenon**
- **Spectroscopic & Electrochemical study of the Acid/Base Doping Ability of High-T Polymer Electrolyte Membranes**
- **Anti-microbial Polymeric Materials with Controlled Release Characteristics**
- **Dispersion of Carbon Nanotubes and Nanoparticles in Polymer Matrixes**
- **Infiltration/Embedment of CNTs in Porous Polymer Membranes**
- **Protective textiles - Assessment of stabbing & shooting impact on the materials at the molecular level**

[1] with Iphigenia Spa (Teacher of Classical Philosophy in the 21st High School of Patras)
[2] Chryssoula/Silia (Physician, Graduate of the School of Medicine of the Univ. of Patras 2013, Medical trainee in Klinikum Ingolstadt GmbH 2017-); Maria-Michailia (Physician, Graduate of the School of Medicine of the Aristotle University of Thessaloniki 2018, Medical trainee in Papageorgiou Hospital Thessaloniki); Archelaos (in the School of Electrical and Computer Engineering of the Aristotle University of Thessaloniki)

## *PROFESSIONAL EXPERIENCE*

**Research Director,** *FORTH/ICE-HT, Patras, Greece* (January 2011 – **Today**)

**Member/Chair[3] of the Scientific Council of FORTH/ICE-HT** (July 2020 – **Today**)

**Member/Chair[3] of the Scientific Council of FORTH/ICE-HT** (July 2018 – July 2020)

**Member/Chair[3] of the Scientific Council of FORTH/ICE-HT** (July/August 2016 – July 2018)

**Member[3] of the Scientific Council of FORTH/ICE-HT** (February 2014 – June 2016)

**Member[3] of the Scientific Council of FORTH/ICE-HT** (February 2011 – December 2013)

**Member[3] of the Scientific Council of FORTH/ICE-HT** (January 2008 – January 2011)

**Member[3] of the Scientific Council of FORTH/ICE-HT** (March 2004 – December 2007)

**Member[3] of the Scientific Council of FORTH/ICE-HT** (December 2001 – February 2004)

**Principal Researcher,** *FORTH/ICE-HT, Patras, Greece* (February 2000 – December 2010)

**Adjunct Professor**, *Interdepartmental Operational Program for Education & Initial Vocational Training on Polymer Science &Technology of the University of Patras / Chemistry Dept U-Patras* (Sept 1999 / 2010 – 2018)

**Member of the Administrative Council of the Association of Greek Researchers** (December 1998 – December 2000)

**Associate Researcher**, *FORTH/ICE-HT, Patras, Greece* (February 1997 – January 2000)

**Assistant Researcher**, *FORTH/ICE-HT, Patras, Greece* (February 1995 – January 1997)

**Educational & Research Scientist**, *Department of Chemical Engineering, University of-Patras & FORTH/ICE-HT, Patras, Greece* (April 1992 – January 1995)

**Guest Scientist**, Institut für Physikalische Chemie und Elektrochemie, University of Karlsruhe, Germany
*Installation and operation of a Raman spectrometer for high temperature spectroelectrochemical studies. In situ Raman measurements during electrolysis of refractory metal halide melts for electroplating.*
(January – March 1992), (August & September 1995), (July 1996)

**Teaching Assistant**, *Department of Chemical Engineering, University of Patras, Patras, Greece*
*Assisted in instruction of the undergraduate courses: "Lab of Instrumental Chemical Analysis" "Lab of Physical/Chemistry and Materials II", "Technology of Polymers and Organic Materials I" and "Techn. of Polymers and Organic Materials II*"
(March 1986 – June 1991)

**Military Service**, Sergeant in the Corps of Provision and Transport & Tommy gun fighter in the Greek Army, Sparta - New Chalkidona, Greece (April 1984 – January 1986)

**Research Assistant**, Laboratoire de Chimie de l'Ecole Normale Supérieure, Paris, France
*Comparison of some methods to improve the problem of detecting weak proton magnetic resonances (i.e. of proteins) in the presence of nearby strong peaks (i.e. of water) and increase the dynamic range in Fourier Transform $^1H$ NMR* (March - June 1983)

## *PROFESSIONAL AFFILIATIONS*

Controlled Release Society (**CRS**) 2006, 2008; American Chemical Society (**ACS**) 1994-2004, **CLINAM** 2008-09, **ESNAM** 2009, Hellenic Polymer Society / Hellenic Optical Society / Association of Greek Chemists / Association of Greek Researchers

## *RESEARCH TEAM 2021*

*Laboratory of Applied Molecular Spectroscopy (LAMS) – Physical Chemistry & Materials*

| | | | |
|---|---|---|---|
| Dr. Konstantinos Andrikopoulos[4] | Assoc. Prof., | Physicist | (AUTH) |
| Dr. Amaia Soto Beobide | Post Doc, | Physical Chemist | (U-Basque Country) |
| Dr. George Mathioudakis | Post Doc, | Material Scientist | (U-Patras) |
| Dr. Zoi Lada | Post Doc, | Chemist | (U-Patras) |
| Msc. Glykeria Visvini | PhD student, | Physicist | (U-Patras) |
| Msc. Konstantinos Papapetros | PhD Student | Physicist | (U-Patras) |
| Mr Tsaousis Panagiotis | Msc Student | Physicist | (U-Patras) |

[3] Elected

[4] Associated Professor in the Physics Department of the University of Patras, Visiting Faculty Member of FORTH/ICE-HT

# *RESEARCH EXPERIENCE - OVERVIEW*

***Publications in Refereed Journals: 96***
*(1st publication in **1992**)*

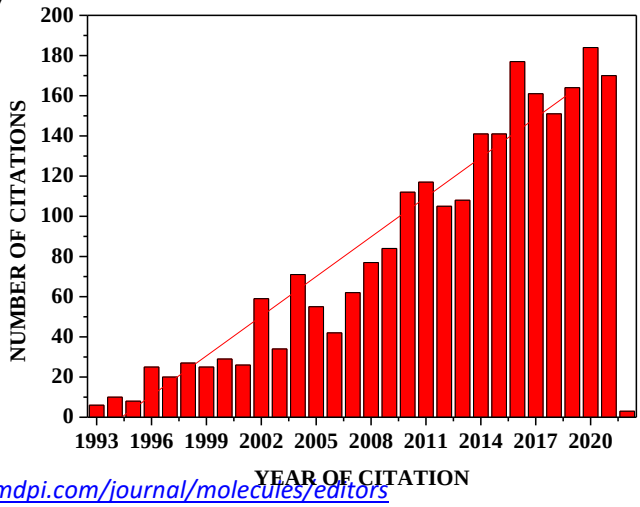
***Publications in Book Chapters: 1***

***Journal Publications of Refereed Conference Proceedings: 2***

***Publications in Refereed & Cited Conference Proceedings: 9***

***Citations[5]: 2402** (Self citations 138)*

***H-index: 26 (i10-index: 65)[6]***




***Editorial Board Member of Molecules:*** https://www.mdpi.com/journal/molecules/editors

***Topic Editor of Nanomaterials*** *(12/2019-8/2021)*

***Regional Editor:*** ***R****ecent* ***P****atents on* ***D****rug* ***D****elivery &* ***F****ormulation*[7] (2010-2017)
***Editorial Advisory Board Member:*** ***R****ecent* ***P****atents on* ***D****rug* ***D****elivery &* ***F****ormulation*[5] (2006-2010)

***Reviewer for 63 # International Journals[8] [x121]:***

x1 *Chemical Society Reviews*(34,09); x1 *Advanced Materials*(18,96); x1 *Chem Eng J*(8,355); x1 *Biomaterials*(8,387); x1 Advances in Colloid and Interface Science(8,243); x1 *Nanoscale*(7,76); x1 *ChemSusChem*(7,116); x13 *Journal of Materials Chemistry*(6,626); x1 *Journal of Materials Chemistry A*(8,262); x8 *Carbon*(6,198); x1 *Chemical Engineering Journal*(6,15); x5 *Journal of Membrane Science*(6,035); x3 *Acta Biomaterialia*(6,008); x1 *Environmental Science: Nano* (5,896); x4 *Journal of Materials Chemistry C*(5,026); x1 *Journal of Materials Chemistry B*(4,872); x6 *Journal of Hazardous Materials*(4,836); x1 *Macromolecular Rapid Communications*(4,638); x2 *Physical Chemistry Chemical Physics*(4,449); x1 *J Phys Chem C*(4,309); x1 *Nanomaterials*(4,034); x3 *Soft Matter*(3,798); x1 *Macromolecular Bioscience*(3,680); x1 *International Journal of Pharmaceutics*(3,994); x1 *Polymer*(,3,586); x1 *European Polymer Journal*(3,485); x1 *Current Medicinal Chemistry* (3,455); x2 *Process Safety and Environmental Protection*(,3,441); x3 *Polymers* (3,426); x3 *Journal of Polymer Science Part B: Polymer Physics*(3,318); x3 *RSC Advances*(3,289); x1 *Optics & Laser Technology* (3,233); x1 *Molecules* (3,060); x1 *Macromolecular Materials and Engineering* (2,860); x1 *J Raman Spectrosc*(2,809); x1 *Materials Science in Semiconductor Processing*(2,772); x1 *Membranes*(2,690); x3 *Journal of Pharmacy and Pharmacology*(2,363); x1 *Journal of Solid State Chemistry*(2,265); x1 *Journal of Applied Electrochemistry*(2,223); x1 *Journal of Applied Microbiology*(2,156); x1 *Energies*(2,077); x1 ***Processes***(1,963); x1 *Applied Spectroscopy*(1,798); x1 *European Physical Journal E*(1,625); x1 *Journal of Molecular Structure*(1,780); x1 *European Physical Journal B*(1,223); x1 *Physica Status Solidi-b*(1,522); x4 *Journal of Applied Polymer Science*(1,866); x3 *Nanomaterials and Nanotechnology* (1,109); x2 *Journal of Analytical Methods in Chemistry* (1,369); x6 *Recent Patents on Drug Delivery & Formulation* (1,13); x1 *Materials Research Express* (0,968); x1 *Journal of Materials Science and Chemical Engineering*(0,89); x1 *Advanced Composites Letters*(0,422); x4 *Macromolecular Symposia*(0,913); x1 *Ber Bunsenges Phys. Chem.* (1,531); x2 *J Nanostructured Polym Nanocomposites* (0,33); x1 *Graphene Technology*?; x1 *ACS Applied Nanomaterials*; x1 *Environmental Advances*; x1 *Journal of Composites Science*

***Adjudicative Reviewer for 3 # International Journals[7] [X4]:*** x2 *Journal of Materials Chemistry*(6,101); x1 *Journal of Materials Chemistry B*(4,872); x1 *Journal of Pharmaceutical and Biomedical Analysis*(3,169);

***Editor - decision:*** x1 *Molecules* (3,060)

***Expert for Funding Organization:*** *Greek* ***G****eneral* ***S****ecretariat for* ***R****esearch and* ***T****echnology*

***Evaluator for Funding Organization***: *NSF; AIAS-COFUND Marie Curie fellowships 2014-2019 & 2021; Shota Rustaveli National Science Foundation (SRNSF) Scientific proposals; EU Horizon-2020 (X2); General Secretariat for Research and Technology; GR State Scholarships Foundation (IKY)*

***Spin-off companies:***
*Founding scientist of the spin-off company ADVENT TECHNOLOGIES S.A.* (February 2005) –
***Advent Technologies*** made its debut and start trading on the **Nasdaq Exchange** (NASDAQ:**ADN**), on February 5, 2021 after its SPAC merger with ***AMCI Acquisition.***

***Patents:*** *3 Greek granted; 1 European withdrawn*

***External funding of Research Activities of LAMS: ~ 5,581,000.00 €***

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[5] *Sources:* ***Web of Science***, ***Scopus***, ***Google Scholar***
[6] https://scholar.google.gr/citations?user=6knuYLgAAAAJ&hl=el
[7] ***Journal of Bentham Science Publishers****; RPDDF publishes review articles by experts on recent patents on drug delivery and formulation.*
[8] 2018 or latest impact factor

# *EDUCATIONAL EXPERIENCE - OVERVIEW*

***Supervision of PhDs, MScs & Diploma works*** (explicitly described below & in next pages)

| Supervision | Defended | On going |
|---|---|---|
| ***PhD***s | ***12*** | ***2*** |
| ***MSc***s | ***16*** | ***1*** |
| ***Diploma Work***s | ***14**** | ***0*** |

***** 18 students

***Participation in more than 35 3$^{membered}$ consulting committees of post-graduated students***

## *Teaching - Courses Taught*

Undergraduate

*[1992-1995]*: (1) Physicochemical Properties of Materials, (2) Analytical Chemistry [*with G. Staikos*], (3) Lab. of Analytical Chemistry [*with G. Staikos*] Department *of Chemical Engineering, University of Patras*

Graduate

*[1999-2013]*: (1) **Polymers and Environment**
*Interdepartmental Operational Program for Education and Initial Vocational Training on Polymer Science and Technology of the University of Patras*

*[1999-***today***]*: (2) **Characterization of Polymers** [Coordination; Co-teaching]
*Interdepartmental Operational Program for Education and Initial Vocational Training on Polymer Science and Technology of the University of Patras.*

*[2010-***15-today***]:*(3) ***Vibrational spectroscopic techniques***
*Within "Analytical Chemistry & Nanotechnology", "Synthetic Chemistry", "Medical Chemistry and Chemical Biology", Chemistry Department, University of Patras*

*[2019-***today***]*: (4) **Materials Characterization Techniques AND Technological Applications of Functional Materials**
*Within* "*Materials Chemistry and Technology with Applications to Industry, Energy and the Environment", Chemistry Department, University of Patras*

## *PhD Supervision*

**Doctoral Dissertations Completed/Defended** (Date of defence)

1. **Konstantinos Andrikopoulos**, Department of Chemical Engineering, University of Patras (**05-02-2001**)
*Title*: Vibrational spectroscopic studies of the molecular orientation of polymer samples with the perspective of the development of an on line process control during plastic pipes extrusion

2. **Amaia Soto Beobide**, Department of Chemical Engineering, University of Patras (**24-04-2002**)
*Title*: Molecular orientation study of poly(ethylene nahthalate) / poly(ethylene terephthalate) (PEN/PET) copolymers utilizing polarized Raman spectra and specular reflection infrared dichroism

3. **Sophia Iconomopoulou**, Interdepartmental Operational Program for Education and Initial Vocational Training on Polymer Science and Technology – Department of Physics, University of Patras (**07-03-2005**)
*Title*: Study of the release of antimicrobial agents from polymeric matrixes

4. **Theoharia Sideroudi**, Department of Chemical Engineering, University of Patras (**11-12-2006**)
*Title***:** Spectroscopic study of ocular diseases and medicines detection

5. **Nikolaos Chourdakis** Interdepartmental Operational Program for Education and Initial Vocational Training on Polymer Science and Technology – Department of Physics, University of Patras (**07-05-2010**)
*Title*: Study of modified polymeric membranes for proton conducting fuel cell & gas separation applications

6. **Anastasios Manikas** Interdepartmental Operational Program for Education and Initial Vocational Training on Polymer Science and Technology – Department of Physics, University of Patras (**16-02-2011**)
*Title*: Development of a new Surface Enhanced Raman Scattering (SERS) technique for quantitative measurements of active agents at very low concentration range

7. **Helen Moshopoulou**, Department of Chemical Engineering, University of Patras (**09-02-2015**)
*Title*: Differentiation of micro/nanoporous structure of polyolefins for the development of breathable non-woven nosocomial products

8. **Ioannis Anastasopoulos**, Department of Chemical Engineering, University of Patras (**09-03-2015**)

*Title*: Development of carbon nanotube membranes for waste water treatment and surface enhanced Raman scattering study of the membrane efficiency and eventual contamination caused.

**9. Argyrios Nochos**, Department of Pharmacy, University of Patras (**22-06-2015**)
*Title*: Encapsulation of active agents in biocompatible polymers & their release study

**10. George Mathioudakis** Department of Chemistry, University of Patras **(08-04-2109)**
*Title*: Characterization of Novel Polymeric Materials with potential controlled biostatic activity

**11. Sonia Andrikaki** Department of Materials Science, University of Patras **(10-05-2019)**
*Title*: Spectroscopic monitoring of eventual release of (nano)materials from biopolymeric packaging matrixes into food simulants

**12. Zoi Lada** Department of Chemistry, University of Patras **(14-05-2019)**
*Title*: Development and study of materials with "smart" properties for their potential use in food packaging

### Doctoral Dissertations in Progress

1. Glykeria Visvini Department of Physics, University of Patras
*Title*: Study of advanced nano-carbon based polyolefinic breathable composites

2. Konstantinos Papapetros Department of Chemical Engineering, University of Patras
*Title*: Molecular characterization and study of the anisotropy of nanocellulose composites

## *MSc Supervision*

### Master Dissertations Completed/Defended

**1. Leoni Velli**, Interdepartmental Operational Program for Education and Initial Vocational Training on Polymer Science and Technology – Department of Physics, University of Patras (**24-7-2001**)
*Title*: Molecular orientation study of drawn polymer blends of a commercial & a biodegradable polymer utilizing *in situ* polarized Raman spectra

**2. Sophia Iconomopoulou**, Interdepartmental Operational Program for Education and Initial Vocational Training on Polymer Science and Technology – Department of Physics, University of Patras (**28-7-2002**)
*Title:* Molecular orientation study of PBT/PC polymer blends utilizing vibrational spectroscopy

**3. Stamatina Roma**, Interdepartmental Operational Program for Education and Initial Vocational Training on Polymer Science and Technology – Department of Physics, University of Patras (**23-3-2004**)
*Title*: Spectroscopic and Electrochemical study of proton conduction in high temperature Polymer Electrolyte Membranes

**4. Nikolaos Chourdakis**, Interdepartmental Operational Program for Education and Initial Vocational Training on Polymer Science and Technology – Department of Physics, University of Patras (**23-3-2004**)
*Title*: The effect of the molecular orientation on Polymer Electrolyte Membranes

**5. Anastasios Manikas**, Interdepartmental Operational Program for Education and Initial Vocational Training on Polymer Science and Technology – Department of Physics, University of Patras (**9-3-2006**)
*Title*: Comparative study of analytical and approximated methods in the evaluation by polarized Raman spectra of the molecular orientation of uniaxially drawn polymers

**6. Dimitra Peristeraki**, Interdepartmental Operational Program for Education and Initial Vocational Training on Polymer Science and Technology – Department of Physics, University of Patras (**9-11-2006**)
*Title*: Spectroscopic and Electrochemical investigation of the ability of PBI based Proton Electrolyte Membranes to be doped by an amphoteric agent

**7. Argyrios Nochos**, Department of Pharmacy, University of Patras (**22-10-2008**)
*Title*: Investigation of the migration and the release of antimicrobial substances from polymer fibres utilized in multifunctional textiles

**8. Efrosini Vogli**, Interdepartmental Operational Program for Education and Initial Vocational Training on Polymer Science and Technology – Department of Physics, University of Patras (**4-3-2009**)
*Title*: Spectroscopic investigation of the protonation step in the doping procedure of high-temperature polymer electrolyte membranes

**9. Helen Moshopoulou**, Interdepartmental Operational Program for Education and Initial Vocational Training on Polymer Science and Technology – Department of Physics, University of Patras (**17-3-2011**)
*Title*: Investigation of polymer mixtures of aliphatic and aromatic polyesters

**10. John Anastasopoulos**, Interdepartmental Operational Program for Education and Initial Vocational Training on Polymer Science and Technology – Department of Physics, University of Patras (**17-3-2011**)
*Title*: Use of SERS to the controlled release studies of small molecular weight substances from polymer matrixes

**11. Dimitra Sclavounaki,** Interdepartmental Operational Program for Education and Initial Vocational Training on Polymer Science and Technology – Department of Physics, University of Patras (**19-11-2012**)
*Title*: Embedment of Carbon nanotubes in porous polymer membranes

**12. Sonia Andrikaki**, Interdepartmental Operational Program for Education and Initial Vocational Training on Polymer Science and Technology – Department of Physics, University of Patras (**15-7-2013**)
*Title*: Spectroscopic monitoring of the release of nanomaterials incorporated into biopolymers

**13. Maria Xirou** Department of Chemistry, University of Patras (**15-12-2017**)

*Title*: Development of chemically assisted SERS method for the identification and quantitative analysis of chemical compounds at low concentrations

**14. Dimitris Kyriakopoulos** Interdepartmental Operational Program for Education and Initial Vocational Training on Polymer Science and Technology – Department of Physics, University of Patras (**11-7-2018**)

*Title*: Development and study of thermoplastic composite materials

**15. Konstantinos Papapetros** Department of Chemical Engineering, University of Patras **(8-9-2021)**

*Title*: Characterization of yarns/fabrics and surface modification for one-stage dyeing; assessment of the environmental impact of process.

**16. Vassiliki Alexiou** Department of Physics, University of Patras **(22-9-2021)**

*Title*: Study of protective textiles based on carbon nanotubes composite

## Master Dissertations in progress

1. Panagiotis Tsaousis Interdepartmental PG Program, Science&Technology of Polymeric & Composite Materials, U-Patras

*Title*: Study of the migration of biopolymer based packaging materials into food simulants.

**Visiting Students**

The Doctors of Science, PhD as well undergraduate students shown below spent at least 1 month in LAMS either performing measurements in the context of project/scientific collaborations or preparing a significant part of their PhD or diploma work.

**Dr. Michael Bachtler,** Ph.D. 1993, University of Karlsruhe, Germany
"*Elektrochemische und simultane spektroskopische untersuchungen des mechanismus der Tantal-und Niobabscheidung in Alkalihalogenidschmelzen*"
**Dr. Christian Rosenkilde,** Ph.D. 1994, Norwegian Institute of Technology, Trondheim, Norway
"*Niobium and Tantalum chlorides and oxochlorides in alkali chloride melts. Spectroscopic and electrochemical Studies*"
**Dr. Oluf Bøckman,** Ph.D. 1999, NTNU University of Trondheim, Norway
"*Cobalt cementation in Zinc electrowinning*"
**Dr. Sandrine Lenoir,** Ph. D. 2003, CERM University of Liege, Belgium
"*Spectroscopic examination of the incorporation of active groups in immobilized type antimicrobial polymers*"
**Dr. Lars Nilausen Cleemann,** Ph. D. 2005, Department of Chemistry, Danish Technical University, Lyngby, Denmark
"*Spectroscopic investigation of the ability of PBI-based polymer electrolyte membranes to be doped with phosphoric acid*"
**Ms Audrey Guion**, Student-Engineer in 2nd year at ENSI CAEN – France, Major in Energy – Structural Materials
"*CNT characterization with Raman – Incorporation of CNTs in polymer matrixes"* *[April-August 2010]*
**Ms Dimitra Papoutsoglou,** M.Sc.-Thesis 2013, Fellow of Erasmus Mundus Master in Membrane Engineering (EM3E)
*"Membrane Filtration for wastewater treatment applications"* Univ. Monpellier II –Univ. Zaragoza *[March-April 2013]*

**Diploma Theses Supervision**

Undergraduate Diploma Theses, Dept. Chem. Engineering, University of Patras

**Marianthi Stamouli & Andreas Martis** (PhD involved: Amaia Soto) Presented 14-07-1998
"*Spectroscopic investigation of stretched polymer blends*"
**Christina Vei & Vasiliki Ladika** (PhD involved: Kostas Andrikopoulos) Presented 06-10-1999
"*Molecular orientation relaxation study of partially degraded poly(vinyl chloride) drawn film using polarized Raman spectra and birefringence measurements*"
**Vasilis Papaioannou** (PhD involved: Amaia Soto Beobide) Presented 09-07-2002
"*Molecular orientation study of the amorphous polystyrene and the semi-crystalline polyethylene with polarized Raman spectra"*
**Efrosini Vogli** (PhD involved: Sophia Iconomopoulou)
"*Polarized Raman spectra in the molecular orientation study of the bisphenol A polycarbonate*" Presented 08-07-2003
**Dimitris Antonopoulos & Dimitris Antonatos** (PhD involved: Nikolaos Chourdakis)
"*Molecular orientation study of polymer electrolyte membranes*" Presented 09-10-2003
**Chrisostomos Petrou** (PhD involved: Sophia Iconomopoulou)
"*The release of antimicrobial substances from stretched polypropylene specimens*" Presented 13-10-2004
**Aristidis Fountas** (PhD involved: Amaia Soto Beobide) Presented 12-07-2005
"*MWNT incorporation in polymer matrixes by a modified film casting method – Molecular orientation estimation of relevant uniaxially drawn speciments*"
**Eldi Litsios** (PhD involved: Anastasios Manikas) Presented 12-10-2005
"*Study of different methods in the estimation of the molecular orientation of uniaxially drawn polymers by polarized Raman spectra*"
**Ioanna Rassia & Evangellos Alexis** (PhD & Post doc involved: D. Peristeraki & A. Soto) Presented 12-10-2005
"*Electrochemical and spectroscopic study of polymer electrolyte membranes*"
**Alexandros Mitropoulos** (PhD involved: Dimitra Peristeraki) Presented 19-07-2006
"*Investigation of the ability of PBI based PEMS to be doped with phosphoric acid*"
**Dimitrios Gouliaditis** (PhD & Post doc involved: A. Manikas & A. Soto)
"*Spectroscopic study of chemical substances in SERS substrates*" Presented 18-07-2007
**Anastasios Tyrovolas** (PhD involved: Theoharia Sideroudi) Presented 18-07-2007
"*Non-invasive Raman spectroscopic method of medicines in the aqueous humor of the eye*"
**Anastasios Smirlis** (PhD involved: N. Zoitos) Presented 03-12-2008
"*Release of antimicrobial substances from drawn polymer matrixes: the effect of the molecular orientation*"
**Georgia Manika** (PhD involved: Argyrios Nochos) Presented 03-03-2011
"*Release study of active agents from biodegradable polymers*"

# *RESEARCH & DEVELOPMENT PROJECTS*

Coordinator / Authorized Contact Person / Project Leader:

1. "Strategies for health protection, pollution Control and Elimination of Next generAtion RefractIve Organic chemicals from the Soil, vadose zone and water"

Grant Agreement No: **101037509**, Project Acronym: **SCENARIOS**, Total score: **15/15**
*Call*: Building a low-carbon, climate resilient future: European Green Deal H2020-2020, LC-GD-8-1-2020
FORTH/ICE-HT Budget: 929 k€ Total Budget: 11985 k€ (Nov 1, 2021 – Oct. 31 **2025**)
Partners: UPO (IT), UNILE (IT), COMET (ES), BGU (IL), UCLM (ES), BFR (DE), SENSOIL (IL), LOMARTOV (ES), LIST (LU), NTUA (EL), NovaM (CY), TAU (FI), UoB (GB), ENVYTECH (SE), AOAL (IT), GEO (DM), IDP (ES), POLOGGB (IT).
ICE/HT Researchers: ***G. Voyiatzis*** *(Authorized contact person)*, Chr. Tsakiroglou, Chr. Aggelopoulos

2. "High Performance Industrial Materials based on Nanocellulose"

Proposal Ref No.: **T2ΕΔΚ-01394**/ Project Acronym: **HIPERION**
I*mplemented under the "Action for the Strategic Development on the Research and Technological Sector", funded by the Operational Programme "Competitiveness, Entrepreneurship and Innovation - II" (NSRF 2014-2020) and co-financed by Greece and the European Union (European Regional Development Fund).*
FORTH/ICE-HT Budget: 185 k€ Total Budget: 997 k€ (July 29, 2021 – Nov. 28 **2023**)
Partners: CERTH/CPERI, AUA, UTH/AGR, CHIMAR HELLAS SA, API EUROPE/AMERICAN PROCESS
ICE/HT Researchers: ***G. Voyiatzis*** *(Authorized contact person)*, V. Drakopoulos

3. "Development and scaled Implementation of sAfe by design tools and Guidelines for multicOmponent aNd hArn nanomateriaLs"

Grant Agreement No: **953152**, Project Acronym: **DIAGONAL**, Call: Safe by design, from science to regulation: multi-component nanomaterials (RIA), H2020-NMBP-TO-IND-2018-2020, NMBP-16-2020
FORTH/ICE-HT Budget: 321 k€ Total Budget: 6265 k€ (May 1, 2021 – Oct 31, **2024**)
Partners: UNIVERSIDAD DE BURGOS (Coord), CNRS, WAGENINGEN UNIVERSITY, NOVAMECHANICS, QSAR, LIST, IZES, Phornano, IRIS, MONOLITHOS, CREATIVE NANO, OCSiAl etc.
ICE/HT Researchers: ***G. Voyiatzis*** *(Authorized contact person)*, V. Drakopoulos, M. Klapa, N. Karamanos

4. "Industrial development of lightweight protection body armor for military and civil-commercial applications"

Proposal Ref No.: **T6ΥΒΠ-00014**/ MIS: 5066800, Project Acronym: **THORAX-D**
*Implemented under the "Action for the Strategic Development on the Research and Technological Sector", funded by the Operational Programme «Specific Action 'Industrial Materials' " (NSRF 2014-2020) and co-financed by Greece and the European Union (European Regional Development Fund).*
FORTH/ICE-HT Budget: 115 k€ Total Budget: 600 k€ (May 26, 2020 – May 25, **2023**)
Partners: Univ-PATRAS, ADAMANT COMPOSITES Ltd, MIRTEC SA, MOD-GR, SIAMIDIS SA.
ICE/HT Researchers: ***G. Voyiatzis*** *(Coordinator)*

5. "Development of nano carbon embedded breathable polyolefin films for industrial/construction roofing membranes"

Proposal Ref No.: **T6YBP-00337**/ Proposal Acronym: **ROOF-BREATH**
*Implemented under the "Action for the Strategic Development on the Research and Technological Sector", funded by the Operational Programme «Specific Action 'Industrial Materials' " (NSRF 2014-2020) and co-financed by Greece and the European Union (European Regional Development Fund).*
FORTH/ICE-HT Budget: 190 k€ Total Budget: 590 k€ (June 18, 2019 – June 17, **2022+**)
Partners: THRACE PLASTICS SA (Coordinator); PLASTIKA KRITIS SA
ICE/HT Researchers: ***G. Voyiatzis*** *(Scientific Coordinator), Th. Ioannides, J. Kallitsis, S. Pandis, N. Karamanos*

6. "Protective Textiles based on Carbon Nanotube Composites"

Proposal Ref No.: **DE3DE-0146** / Proposal Acronym: **PROTECT**
ERANET INCOMERA 3rd Transnational Call 2017 NMP Thematic
FORTH/ICE-HT Budget: 147 k€ Total Budget: 620 k€ (1 Oct., 2018 – 31 May, **2021**)
Partners: Nafpaktos Textiles SA (GR); ZM Makina Tekstil (TR); Internet tekstil (TR);
Subcontractors: SOURIS SA (GR), CETI (FR); AITEX (ES); Univ. of Gaziamtep (TR);
ICE/HT Researchers: ***G. Voyiatzis*** *(Coordinator)*, V. Drakopoulos, G. Fouskas

7. "Development of Surface Coating Processes in Cotton Yarns / Fabrics for Single Stage Dyeing with Reduced Environmental Impact"

Proposal Ref No.: **T1EDK-03073** / Proposal Acronym: **ChromaSurf**
I*mplemented under the "Action for the Strategic Development on the Research and Technological Sector", funded by the Operational Programme "Competitiveness, Entrepreneurship and Innovation - I" (NSRF 2014-2020) and co-financed by Greece and the European Union (European Regional Development Fund).*
FORTH/ICE-HT Budget: 195 k€ Total Budget: 803 k€ (July 9, 2018 – April 8, **2022**)

Partners: COLORA SA, SOULIS-KUEHNIS AG; MHK ELVIFA; MIRTEC SA; UNIV. PATRAS
ICE/HT Researchers: ***G. Voyiatzis*** *(Coordinator),* V. Drakopoulos

8. "Lightweight, flexible and smart protective clothing for law enforcement personnel"
*Funded* by CEU, FP7-SEC- 2013.1.4-1: Smart and protective clothing for law enforcement and first responders – Capability Project. Proposal Ref No.: **607295** / Proposal Acronym: **SMARTPRO**
FORTH/ICE-HT Budget: 626 k€ Total Budget: 3.837 k€ (April 1, 2014 – September 30, 2017)
Partners: EBETAM AE (Coord) (GR), LEITAT (ES), NTT (IT), SIAMIDIS (GR), RWTH (DE), BCB International Lt (UK), SOILANI EMC (IT), CIMA (ES), INT (ES),
ICE/HT Researchers: ***G. Voyiatzis*** *(Authorized contact person),* S. Yannopoulos, J. Kallitsis, T. Ioannides V. Drakopoulos + G. Petekidis (FORTH/IESL) + V. Deimede (U-P)

9. "Intelligent Protective Textiles for high risk professions"
*Funded* by Western GR-region & CEU. FP-7 LeadEra 2013Lead Markets European Research Area Network
Project Code: **2013-006**. OPS: **465433**. Proposal Acronym: **INPROTEX**
FORTH/ICE-HT Budget: 141 k€ Total Budget: 304 k€ (February 1, 2014 – July 31, 2015)
Partners: FORTH/ICE-HT (Coord) (GR), KORDSA (TR), KALOGERAKIS SA - ELVIFA (GR)
ICE/HT Researchers: ***G. Voyiatzis*** *(Coordinator)*

10. "Flame-retardant coatings based on nano-magnesium hydroxide, huntite and hydromagnesite for wood applications"
*Funded* by CEU, FP7 -SME-2013, Research for the benefit of specific groups Project type: BSG-SME Proposal Reference No.: **315425** / Proposal Acronym: **WOOD-FLARETCOAT**
FORTH/ICE-HT Budget: 219 k€ as subcontractor Total Budget: 1.447 k€ (January 1, 2014 – Dec 31, 2015)
Partners: L´urederra (Coord) (ES), Humichem (ES), Ingarp (SE), IGP (DE), Loufakis (GR), Eurochem (IR), Adigest (ES), IPF (DE), SP Trätek (SE).
ICE/HT Researchers: ***G. Voyiatzis*** *(In charge of scientific aspects of subcontracting),* J. Kallitsis, T. Ioannides, V. Drakopoulos

11. "Extended shelf-life biopolymers for sustainable and multifunctional food packaging solutions"
*Funded* by CEU, FP7-NMP-2011 Large scale integrating collaborative project 5
NMP-2011.1.1-1 Smart and multifunctional packaging concepts using nanotechnology
Project Reference No.: **280759-2** / Proposal Acronym: **NanoBarrier**
FORTH/ICE-HT Budget: 1.138 k€ Total Budget: 9.941 k€ (March 1, 2012 – February 29, 2016)
Partners: SINTEF (NO), MPI (DE), UM (SLO), UAV (PT), ITE (ES), INN (SE), LOG (PT), ARG (GR), GRA (FR), PLA (DE), PRA (PT), ELA (FI), BOR (NO), SCA (SE)
ICE/HT Researchers: ***G. Voyiatzis*** *(Person in charge of scientific and technical/technological aspects),* J. Kallitsis, V. Burganos, S. Yannopoulos, T. Ioannides, N. Karamanos + G. Bokias (U-P)

12. "Achieving scalable tinctorial capacity on cotton yarns and fabrics"
*Funded* by GSRT, SMS R&D support group 2nd cycle, Added Value Products & Production Technologies in Traditional Greek Sectors
Project No.: **261** / Proposal Acronym: **KLIMAX** (SCALE)
FORTH/ICE-HT Budget: 90 k€ as subcontractor Total Budget: 348 k€ (July, 2012 – June 20, 2015)
Partners: COLORA SA, SOULIS-KUEHNIS AG; collaboration VASSARAS SA & CLOTHEFI SA
ICE/HT Researchers: ***G. Voyiatzis*** *(Person in charge of scientific aspects of subcontracting),* J. Kallitsis, V. Drakopoulos + G. Bokias (U-P)

13. "Development of advanced multifunctional non-woven products"
*Funded* by GSRT, **SYNERGASIA** program, New Applications of Textiles
Proposal No: 1156 / Proposal Acronym: **ANAPNOH** (BREATH)
FORTH/ICE-HT Budget: 196 k€ Total Budget: 797 k€ (January 24, 2011 – January 23, 2014)
Partners: CERTH/CPERI/LPRE, CLOTHING TEXTILE & FIBRE TECHNOLOGY DEVELOPMENT COMPANY SA (CLOTEFI SA), THRACE NON WOVENS & GEOSYNTHETICS SA (DON & LOW HELLAS SA), NANOTHINX SA
ICE/HT Researchers: ***G. Voyiatzis*** *(Coordinator),* J. Kallitsis, T. Ioannides, V. Dracopoulos

14. "Development of the next generation membrane bioreactor system"
*Funded* by CEU, **FP7-NMP**-2009-2.6-1 Novel membranes for water technologies (SICA)
Proposal Reference No.: 246039-2 / Proposal Acronym: **BioNexGen /** Total score: **14,3/15**
FORTH/ICE-HT Budget: 736 k€ Total Budget: 4291 k€ (Sept. 1, 2010 – February 28, 2014)
Partners: HSKA (D), CNR-ITM (I), UON (UK), SEZ (D), MN (D), IZTECH (TR), ABU (SY), CMRDI (EG), CBS (TU), NANOTHINX (GR)
ICE/HT Researchers: ***G. Voyiatzis*** *(Authorized contact person),* J. Kallitsis, V. Mavrantzas, V. Burganos, N. Karamanos, A. Siokou, V. Drakopoulos

15. "Release of active agents from biodegradable polymers"
Funded by YPEPTH, **HRAKLEITOS-II** program, Department of. Pharmacy, University of. Patras
Proposal No: **12 / 119 / 5** /; Enhancing Human Research Potential via PhD Implementation

Total Budget of PhD elaborated at FORTH/ICE-HT: 45 k€ (September 1, 2010 – August 31, 2013)
3 membered PhD consulting committee: C. Kontoyannis, G. Voyiatzis, M. Orkoula
ICE/HT Researchers: ***G. Voyiatzis*** *(De facto advisor of the PhD of Argyrios Nochos)*

16. "Development of a bioelectrochemical device for Central Nervous System repair"
*Funded* by CEU, ADVENTURE NEST-STREP program
Proposal No: **028473** Proposal Acronym: **NERBIOS**
FORTH/ICE-HT Budget: 562 k€ Total Budget: 2144 k€ (November 2006 – November 2009)
Partners: SESCAM-HNP (ES), UNIABDN (UK), CSIC (ES), INEB (Portugal)
ICE/HT Researchers: ***G. Voyiatzis*** *(Authorized contact person)*, S. Neophytides

17. "Development of advanced multifunctional textiles"
*Funded* by GSRT (GR), Operational Program of Western Greece,
Proposal No: **PEP_DEL_19** Proposal Acronym: **POLYLEITOYRGIKA** (MULTIFUNCTIONAL)
FORTH/ICE-HT Budget: 202 k€ Total Budget: 978 k€ (April 2006 – May 2008)
Partners: Argo S.A., Soulis-Kuehnis A.G., Patraiki S.A., ELVIFA S.A., CLOTHEFI
ICE/HT Researchers: ***G. Voyiatzis*** *(Coordinator)*, J. Kallitsis, T. Ioannides, V. Dracopoulos

18. "Synthesis and modification of nanostructured mixed-matrix membranes for hydrogen recovery improvement"
*Funded* by GSRT (GR), Cooperation with R&D organizations of countries outside Europe – 2005 **GR-USA**"
Total Budget: 60 k€ (October 2006 – April 2008)
Partners: George Tech Institute (USA), S&B Industrial Minerals SA (GR)
ICE/HT Researchers: ***G. Voyiatzis*** *(Greek project leader)*, V. Nikolakis

19. "Development and characterization of novel ion selective materials for PEM type fuel cells"
*Funded* by GSRT (GR), Bilateral Cooperation Program **Greece-Czech**
FORTH/ICE-HT Budget: 12 k€ (May 2006 – March 2008)
Partner: Institute of Chemical Technology Praque (CZ)
ICE/HT Researchers: ***G. Voyiatzis*** *(Greek project leader)*, J. Kallitsis, S. Neophytides

20. "Synthesis and Characterization of Molybdenum Catalysts for Methane Conversion"
*Funded* by GSRT (GR), Bilateral Cooperation Program Greece–Hungary, Project 16
FORTH/ICE-HT Budget: 13 k€ (December 1999 – November 2001)
*Partner*: Institute of Solid State and Radiochemistry, Attila Jozsef University (HU)
*ICE/HT Researchers*: ***G. Voyiatzis*** *(Greek project leader)*, Th. Ioannides, S. Neophytides

21. "Raman spectroscopic investigation of cobalt cementation in zinc purification process"
*Funded* by NORZINK AS (NO), Program / Project NTNU-1
FORTH/ICE-HT Budget: 22 k€ (April 1998 – July 1998)
*Partner*: The Institute of Inorganic Chemistry, Norwegian University of Science and Technology (NO)
*ICE/HT Researcher*: ***G. Voyiatzis*** *(Project leader)*

22. "Vibrational spectroscopic studies of the molecular orientation of polymer samples with the perspective of the development of an on line process control during plastic pipes extrusion"
*Funded* by GSRT (GR) and A.G. Petzetakis S.A. (GR), Program YPER, Project 375
FORTH/ICE-HT Budget: 40 k€ (April 1996 – March 2000)
*ICE/HT Researcher*: ***G. Voyiatzis*** *(Project leader)*

23. "Development of a flexible micro-Raman pilot-probe to monitor on line measurements of PVC pipes molecular orientation during the production process"
*Funded* by GSRT (GR) and A.G. Petzetakis S.A. (GR), Program AXIA, Project 11
FORTH/ICE-HT Budget: 40 k€ (February 1997 – October 1998)
*Partner*: A.G. Petzetakis S.A. Hellenic Plastics & Rubber Industry (GR)
*ICE/HT Researcher*: ***G. Voyiatzis*** *(Project leader)*

<u>Main Investigator</u>:

1. "Development of Novel Functional Copolymers and Surfaces with Permanent and/or Controlled Released Biocidal Species"
   *Funded* by Ministry of Education, THALIS program, "Mathematics, Physics, Chemistry"
   Proposal No: 162 / Proposal Acronym: POLYBIOSURF
   FORTH/ICE-HT Budget: 60 kEuro (February 1, 2012 – Jan/Sept 30, **2015**)
   Total Budget: 512 kEURO
   Partners: UNIVERSITY OF PATRAS (Coordination), FORTH/IESL, TEI of Messolonghi, ESPCI/CNRS (F)
   *ICE/HT Researchers*: ***G. Voyiatzis*** (Co-Investigator)
2. "Implantation of CNTs in Permeable Polymer Matrices"

*Funded* by GSRT, SYNERGASIA program, Nanotechnology applications to the environment
Proposal No: 620 / Proposal Acronym: MEKKA
FORTH/ICE-HT Budget: 225 kEuro (May 3, 2011 – May/November 2, **2014**)
Total Budget: 532 kEURO
Partners: INTERCHEM HELLAS SA, RESEARCH AND DEVELOPMENT OF CARBON NANOTUBES SA
ICE/HT Researchers: V. Mavrantzas (Coordinator), ***G. Voyiatzis***, Ch. Paraskeva, P. Koutsoukos

3. "Polymer Electrolytes and Non Noble Metal Electrocatalysts for High Temperature PEM Fuel Cells"
Funded by CEU, Specific Targeted Research Projects (STREP) FP6-2004-NMP-TI-4
Proposal No: 028473 Proposal Acronym: APOLLON-B
Total Budget: 2,899 kEURO (October 2006 – September **2009**)
Partners: FORTH/ICE-HT (Coordinator), MPG.IKOHLF.HC.NL, DNIM.RD, ICT.DIT, SCIC.ICV, DTH.DP1.CAMP, UPAT.DC, INCH.LCRE, NED-STACK.NL, ADVENT TECHNOLOGIES
ICE/HT Researchers: S. Neophytides (Autorised contact person), ***G. Voyiatzis***, T. Ioannides

4. "Membrane Cell Hydrogen Generator and Electrocatalysis for Water Splitting"
Funded by CEU, INCO Proposal Acronym: PROMITHEAS
FORTH/ICE-HT Budget: 118 kEURO (August 2002 – October 2006)
Partners: FORTH/ICE-HT (Coordinator), University of Belgrade (YU), Central Laboratory of Electrochemical Power Sources (BG), University "St.Cyril and Methodius" – Skopje (FYROM), Chemical Industry ZUPA-Krusevac (YU), University of Zagreb (CR)
*ICE/HT Researchers*: S. Neophytides (Autorised contact person), ***G.A. Voyiatzis***.

5. "An electrical energy production system with polymer electrolyte membrane methanol fuel cell"
EPAN - GGET Contract No.: E-25
FORTH/ICE-HT Budget: 219 kEURO (October 2003 – September 2006)
*ICE/HT Researchers*: Th. Ioannides (Coordinator), S. Neophytides, ***G. Voyiatzis***

6. "Expanding membrane macroscale applications by exploring nanoscale materials properties"
**NanoMemPro**, Nanotechnology & nanosciences, Knowledge based multifunctional materials, new production processes and devises – "NMP" Network of Excellence (NOE) 500632-2
FORTH/ICE-HT Budget: (for the first 18 months): 95 kEURO
(September 2004 – February 2006 – August **2008**)

7. "Non-invasive methods of in-time diagnoses of ophthalmic diseases"
*Funded by* ΓΓΕΤ *Contract No. :* 01 ΕΔ 559 *Total Budget :* 132 kEURO (Nov 2002 – Oct 2005)
*ICE/HT Researchers:* S. Yannopoulos, ***G. Voyiatzis***

8. "Specialty antimicrobial polymeric materials"
Funded by CEU, GROWTH 2000 program, Project: GRD2-2000-30252 Proposal Acronym: SPAN
FORTH/ICE-HT Budget: 359 kEURO (November 2001 – October 2004)
Partners: ARGO SA (Coordinator), FORTH/ICE-HT, ULG (CERM), GAIKER, NAFC, POLISILK, LSP, ROMVAC
*ICE/HT Researchers*: J. Kallitsis (Authorized cont person), ***G. Voyiatzis*** *(Scientific Person in charge of the project)*.

9. "Advanced PEM Fuel Cells (APOLLON)"
Funded by CEU, Energy, Environment and Sustainable Development program,
Project: ENK5-CT-2001-00572
FORTH/ICE-HT Budget: 857 kEURO (December 2001 – November 2004)
Partners: FORTH/ICE-HT (Coordinator), MPG.IKOHLF.HC.NL, DNIM.RD, ICT.DIT, SCIC.ICV, DTH.DP1.CAMP, UPAT.DC, FRIGO.TI, INCH.LCRE
*ICE/HT Researchers*: S. Neophytides (Autorised contact person), ***G. Voyiatzis***

10. "Polymer blends with controlled biostatic properties. Packaging Innovative Applications"
Funded by GSRT, PAVET-2000
Total Budget: 166 kEURO (November 2001- October 2003)
Partners: ARGO S.A. (Coordinator), FORTH/ICE-HT
ICE/HT Researchers: J. Kallitsis, ***G. Voyiatzis***

11. "Advanced Solid Polymers Fuel Cells for Operation at temperatures up to 200$^{o}$ C"
Funded by CEU, Program Joule, Project JOR3-CT97-0045
FORTH/ICE-HT Budget: 192 kEURO (February 1998 – July 2000)
*Partners:* CLC s.r.l. (I) (Coordinator), Denmarks Techniske Universitet, Department of Chemistry (DK) *ICE/HT Researchers:* G. Papatheodorou (PI), J. Kallitsis, ***G. Voyiatzis***, Ch. Kontoyannis

12. ''Optimal design of low-cost advanced polymer blends by altering their interfacial situation''
*Funded* by NATO and GSRT, Program Science for Stability, Project GR-Polyblend
FORTH/ICE-HT Budget: 100 kEURO (May 1993 – April 1998)
*Partners*: FORTH/IESL (Coordinator), Univ. of Athens (Dept. of Chemistry), A.G. Petzetakis S.A., Plastika Kritis S.A.
*ICE/HT Researchers*: ***G. Voyiatzis*** *(Member of the Advisory Committee)*, G. Papatheodorou

13. ''Raman scattering of polymer blends in the critical region analyzed with schematic mode coupling

models''
*Funded* by NATO, Program Science for Stability, Project GR-Polyblend-Outreach Component 2
ICE/HT-FORTH Budget: 20 kEURO (November 1996 – April 1998)
*Partners*: FORTH/IESL (Coordinator), Ukranian National Academy of Science, Institute for Technological and Information Innovations (UKR)
*ICE/HT Researcher*: ***G. Voyiatzis***

Participant as FORTH/ICE-HT Principal Investigator:

1. "Development of water soluble inks for imprinting on packaging plastic materials"
   *Funded* by GSRT, Interchem S.A., Drukfarben S.A., and Chatzopoulos S.A. (GR), Program EPET-II 2nd Announcement, Project 97EKBAN2-129
   FORTH/ICE-HT Budget: 35 kEURO (November 1998 – April 2001)
   *Partners*: FORTH/IESL (Coordinator), University of Patras (Physics Department), Interchem S.A., Drukfarben S.A., Chatzopoulos S.A. (GR)
   *ICE/HT Researcher*: **G. Voyiatzis**
2. "Development of Environmentally Friendly Materials for Coatings"
   *Funded* by GSRT, Interchem S.A., and Neochem S.A., Program EPET-II 1st Announcement, Project EKBAN-431
   FORTH/ICE-HT Budget: 33 kEURO (January 1995 – December 1997)
   *Partners*: FORTH/IESL (Coordinator), NHRF, Interchem S.A., Neochem S.A.
   *ICE/HT Researcher:* ***G. Voyiatzis***
3. "Improvement of polymer properties during processing via physical and chemical alteration"
   *Funded* by CEU and GSRT, Program Stride-Hellas, Project 61
   Total Budget: 1000 kEURO (July 1991 – December 1993)
   *Partners*: FORTH/IESL, FORTH/CREPI, A.G. Petzetakis S.A. (Coordinator)
   *ICE/HT Researcher*: **G. Voyiatzis**

## *EDUCATIONAL PROJECTS*

1. "Interdepartmental Operational Program for Education and Initial Vocational Training on Polymer Science and Technology", University of Patras
   Funded by Ministry of Education
   Lab. Budget: 15 kEURO (January 1998 – December 2000 - **Today**)
   Contribution to the organization and teaching of the following graduate courses: "Polymers and Environment", "Physical, Chemical and Mechanical Characterization of Polymers" and "Polymer Characterization"
2. "Operational Program for Education and Initial Vocational Training on Applied Molecular Spectroscopy", University of Crete
   Funded by Ministry of Education
   Lab. Budget: 10 kEURO (January 1998 – December 2004)
   Contribution to the organization and teaching of the core graduate course "Laboratory of Raman Spectroscopy"

## *SERVICES-TECHNICAL REPORTS*

Our laboratory was involved in a number of services for companies, institutions, municipalities and privates with ~75.000 € incoming funds to the Institute for the period of time 2005-2018; in all cases, a confidential report was compiled.

A representative *pot-pourri* of *reports compiled* is given below:

*"Identification of unknown impoundments in plastic polyethylene tubes" / "Evaluation of the molecular orientation of fibrils developed in the die land during a PTFE paste extrusion process" / "Investigation of polymeric films (with dye-stuffs) covering composite aluminium panels" / "Investigation of the presence of PVC in PVC-free presumed cables" / "Identification of presumable Nylon electric box and flat bearing samples" / "Investigation-identification of polymer specimens" / "Characterization of Ni & Mo γ-alumina supported catalysts" / "Identification of the contamination of the condensate from refrigerant motor" / "«Standardized» essays on geotextiles-geomembranes" / "Investigation of CuCl existence in Cu samples" / "Long-term behavior of recycled core product" / "Investigation of the presence of Cu(I) species on broken copper hanging bars and on cementation product of Cu-concentrate" / "Expert view on the chemical composition of unknown spare disposals" / "Quantitative determination of the presence of $Cr^{+6}$ species in metallic components of refrigerator electric system" / "Identification of sulphates in dust of industrial roasting plant" / "Investigation of the presence of alcohol in coffee drinks" / "Investigation-identification of plastic components" / "Investigation of the ability of sterilized plastic bottles to be refilled with baby milk" / "Analysis of thermoformed film" / "identify material used in cabinets" / "Control of molecular structure and molecular orientation of films" / "Investigation of contaminations in used oil and water determination in oil-contaminated Freon of a refrigerating unit" / "Determination of the presence of sulphur or/and PbS on a PVC-based cable" / "Determination of the form of the filler in polyolefin-based cables" / "Polymer characterization – impurities identification" / "Investigation of the synergistic effect of disinfectants in the development of resisting stains on textiles of operating theaters" / "Carbon nanotube (CNT) characterization" / "Identify specific chemical components on air-filters" /*

## *PUBLICATIONS IN BOOK CHAPTERS*

**[1]** J.A. Anastasopoulos, A. Soto Beobide, T. Karachalios, K. Kouravelou and **G.A. Voyiatzis**
"Study of carbon nanotubes' embedment into porous polymeric membranes for wastewater treatment"
SUSTAINABLE WATER DEVELOPMENTS. RESOURCES, MANAGEMENT, TREATMENT, EFFICIENCY AND REUSE SERIES Edited by J. Bundschuh, Volume **5,** in *Application of Nanotechnology in Membranes for Water Treatment* Edited by Alberto Figoli, Jan Hoinkis, Sacide Alsoy Altinkaya, Jochen Bundschuh, CRC Press/Balkema, Taylor & Francis Group, London, 81-110 (2017). https://www.taylorfrancis.com/books/e/9781351715263/chapters/10.1201%2F9781315179070-5

## *PUBLICATIONS IN REFEREED JOURNALS*

[1] **G.A. Voyiatzis** and G.N. Papatheodorou*
''Raman Spectroscopic Studies of Metal-Metal Halide Molten Mixtures: The Mercury-Mercury (II) Halide Systems''
*Inorg. Chem.* **31**, 1945-1951 (**1992**). 10.1021%2Fic00036a041

[2] G.N. Papatheodorou*, I.V. Boviatsis, and **G.A. Voyiatzis**
''In situ Raman Spectra of Electrode Products during Electrolysis of $HgCl_2$ in Molten LiCl-KCl Eutectic''
*J. Appl. Electroch.* **22**, 517-521 (1992). 10.1007/BF01024091

[3] S. Boghosian*, D.A. Karydis, and **G.A. Voyiatzis**
''Characterization of Vapor Complexes over Molten $POCl_3$-$MCl_3$ (M=Al, Ga) Mixtures: Raman Spectra and Thermodynamics''
*Polyhedron* **12**, 771-782 (1993). 10.1016/S0277-5387(00)81758-1

[4] S. Boghosian* and **G.A. Voyiatzis**
''Raman Spectroscopic Characterization of High Temperature $MGaCl_8$ (M=Nb, Ta) Dinuclear Molecular Complexes in the Liquid and Gaseous State''
*Polyhedron* **12**, 2965-2971 (1993). 10.1016/S0277-5387(00)80047-9

[5] **G.A. Voyiatzis** and G.N. Papatheodorou*
''Changes of Vibrational Modes Upon Melting Mercury (II) Halides''
*Ber. Bunsenges. Phys. Chem.* **98**, 683-689 (1994). 10.1002/bbpc.19940980506/

[6] M. Bachlter, and W. Freyland, **G.A. Voyiatzis**, and G.N. Papatheodorou
''Electrochemical and Simultaneous Optical Study of the Reduction Mechanism and Electronic Conduction During Tantalum deposition in Molten Alkalichlorides''
*Ber. Bunsenges. Phys. Chem.* **99**, 21-31 (1995). 10.1002/bbpc.19950990105/

[7] C. Rosenkilde, **G.A. Voyiatzis**, and T. Østvold*
''Raman Spectroscopic Investigations of the molten CsCl-$TaOCl_3$-$TaCl_5$ system''
*Acta Chem. Scand.* **49**, 405-410 (1995). http://actachemscand.dk/pdf/acta_vol_49_p0405-0410.pdf

[8] C. Rosenkilde, **G.A. Voyiatzis**, V.R.Jensen, M. Ystenes, and T. Østvold*
''Raman Spectroscopic and ab initio Quantum Investigations of Molecules and Complexes Ions in the Molten System CsCl-$NbCl_5$-$NbOCl_3$''
*Inorg. Chem.* **34**, 4360-4369 (1995). 10.1021%2Fic00121a014

[9] S. Boghosian*, **G.A. Voyiatzis**, and G.N. Papatheodorou
''Gas-phase, liquid and solid complexes in $POCl_3$-$FeCl_3$ system''
*J. Chem. Soc., Dalton Trans.* 3405-3410 (1996). 10.1039/DT9960003405

[10] **G.A. Voyiatzis**, G. Petekidis, D. Vlassopoulos*, E. Kamitsos, and A. Bruggeman
''Molecular Orientation in Polyester Films Using Polarized Laser Raman and FTIR Spectroscopies and X-Ray Diffraction''
*Macromolecules* **29**, 2244-2252 (1996). 10.1021%2Fma951199g

[11] Ch. Fountzoula, H.K. Matralis, Ch. Papadopoulou, **G.A. Voyiatzis**, and Ch. Kordulis*

''The influence of the Chromium content on the Physicochemical Properties and the Catalytic Behavior of $CrO_x/TiO_2$ Catalysts for the Selective Catalytic Reduction of Nitric Oxide by Ammonia at relatively high temperatures''
*J. Catal.* **172**, 391-405 (1997). 10.1006/jcat.1997.1845

[12] S.A. Kirillov*, **G.A. Voyiatzis**, and I.S. Musiyenko
''Dephasing of the $\nu_1$ ($\Sigma^+$) and $\nu_3$ ($\Sigma^+$) Vibrations of $SCN^-$ Anion in Molten KSCN:
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"Thermal dewetting tunes optimized Surface Enhanced Resonance Raman Scattering (SERRS) performance"
*RSC Advances*, **8**(51) 29062-29070 (2018). 10.1039/c8ra05451g

[87] Z.G. Lada, K.S. Andrikopoulos*, A. Chrissanthopoulos, S.P. Perlepes* and **G.A. Voyiatzis*** **"**A known Iron(II) Complex in Different Nanoparticle Sizes: Variable-Temperature Raman Study of its Spin-Crossover Behavior"
*Inorg. Chem.*, **58** (8) 5183-5195 (2019). 10.1021/acs.inorgchem.9b00279

[88] E.C. Mazarakioti, A.Soto Beobide, V. Angelidou, C.G. Efthymiou, A. Terzis, V. Psycharis,* **G.A. Voyiatzis*** and Spyros P. Perlepes*
"Modelling the Solvent Extraction of Cadmium(II) from Aqueous Chloride Solutions by 2-pyridyl Ketoximes: An Inorganic Chemistry Approach"
*Molecules*, **24** (12), Art. Nb 2219-16 (2019). 10.3390/molecules24122219

[89] E. Tzanakakis,* E. Kontonasaki, **G. Voyiatzis**, K. Andrikopoulos, I. Tzoutzas,
"Surface characterization of monolithic zirconia submitted to different surface treatments applying optical interferometry and Raman spectrometry"
*Dent. Mater. J.*, **39** (1) 111-117 (2020). 10.4012/dmj.2018-358.

[90] G.N. Mathioudakis, A. Soto Beobide,* G. Bokias, P.G. Koutsoukos and **G.A. Voyiatzis***
"Surface Enhanced Raman Scattering as a tool to study cationic surfactants exhibiting low critical micelle concentration"
*J Raman Spectrosc*, **51** (3), 452-460 (2020). 10.1002/jrs.5798

[91] V. Alexiou, G.N. Mathioudakis, K.S. Andrikopoulos, A. Soto Beobide* and **G.A. Voyiatzis***
"Poly(ethylene terephthalate) carbon-based nanocomposites: a crystallization and molecular orientation study"
*Polymers*, **12** (11), Art. Nb 2626-14 (2020). 10.3390/polym12112626

[92] Zoi G. Lada, K.S. Andrikopoulos,* C.D. Polyzou, V. Tangoulis* and **G.A. Voyiatzis***
"Monitoring the Spin Crossover Phenomenon of Controlled Size $[Fe(2\text{-}mpz)_2Ni(CN)_4]$ 2D Hofmann-type Polymer Nanoparticles *via* Temperature Dependent Raman Spectroscopy"
*J Raman Spectrosc*, **51** (11), 2171-2181 (2020). 10.1002/jrs.5967

[93] G.N. Mathioudakis, A. Soto Beobide,* S.H. Anastasiadis, and **G.A. Voyiatzis***
"Surface Enhanced Raman Scattering of Brilliant Green: packing density and stabilizing effect of the cationic surfactant CTAB on the "hotspot" spacing"
*Colloids Surf A: Physicochem Eng Asp*, **610**, 125912-8 (2021). 10.1016/j.colsurfa.2020.125912

[94] Zoi G. Lada,* Amaia Soto Beobide, Georgios N. Mathioudakis and **George A. Voyiatzis***
"Fe(II) Spin Crossover/Polymer Hybrid Materials: Investigation of the SCO behaviour *via* Temperature Dependent Raman Spectroscopy, Physicochemical Characterization and Migration Release Study"

*Molecules Communication*, **26** (1), Art. Nb 201-12 (2021). 10.3390/molecules26010201

[95] Gabriella Nilsson Hall, Wai Long Tam , Konstantinos S. Andrikopoulos, Leire Casas-Fraile , **George A. Voyiatzis** , Liesbet Geris, Frank P. Luyten,* Ioannis Papantoniou*
"Patterned, organoid-based cartilaginous implants exhibit zone specific functionality forming osteochondral-like tissues in vivo"
*Biomaterials*, **271**, 120820-14 (2021). 10.1016/j.biomaterials.2021.120820

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"Collagen orientation probed by polarized Raman spectra can serve as differential diagnosis indicator between different grades of meniscus degeneration"
*Scientific Reports*, **11**, 20299-10 (2021). 10.1038/s41598-021-99569-2

## ***JOURNAL PUBLICATIONS OF REFEREED CONFERENCE PROCEEDINGS***

[1] A.N. Nochos, S.M. Iconomopoulou, **G.A. Voyiatzis**
"Antimicrobial crosslinked polystyrene nanospheres for specialty multifunctional textile production"
*J. Controlled Release* **132** (3), E75-E76 (2008). 10.1016/j.jconrel.2008.09.068

[2] **G.A. Voyiatzis,*** A.S. Beobide, A. Manikas, S.F. Nitodas, T.K. Karachalios, P.A. Kakavas, C. Boutris, and S. Pavlidou
"Optimized dispersion and orientation **s**tudies of CNTs in polymer matrixes: a new perspective for advanced nanocomposite textiles**"**
*World Journal of Engineering* **7**(1), 30-33 (2010). ISSN:1708-5284 http://wjoe.hebeu.edu.cn/2010.1/4.pdf

## ***PUBLICATIONS IN REFEREED & CITED CONFERENCE PROCEEDINGS***

[1] G.M. Photiadis, **G.A. Voyiatzis**, and G.N. Papatheodorou *(Reviewed)*
''Raman Spectra of Neodymium (III) Chloride-Alkali Chloride Melts and of Solid Compounds''
*Molten Salt Forum* **1-2**, 183-194 (1993).

[2] **G.A. Voyiatzis** and S. Boghosian *(Reviewed)*
''A Raman spectroscopic study of ''adduct'' compound formation in $GaCl_3$-$MCl_5$ (M=Nb, Ta) and $POCl_3$-$FeCl_3$ systems in liquid and gaseous state''
*Molten Salt Chemistry & Technology* **3 / ECS 93-9**: 14-30 (1993).

[3] **G.A. Voyiatzis**, E. Pavlatou, G.N. Papatheodorou, M. Bachtler, and W. Freyland *(Reviewed)*
''Reduction products of Pentavalent Niobium and Tantalum in Fused Chloride Solvents''
*Molten Salt Chemistry & Technology* **3 / ECS 93-9**: 252-264 (1993).

[4] **G.A. Voyiatzis** and S. Boghosian *(Reviewed)*
''Changes of vibrational modes upon melting $CsHgCl_3$, $Cs_2HgCl_4$ and $Cs_3HgCl_5$ solids and Raman spectra of $HgCl_2$-ACl (A=Li, Na, K, cs) molten salt mixtures''
*Molten Salts* **IX / ECS 94-13**: 242-249 (1994).

[5] S. Boghosian, G. Zisi, and **G.A. Voyiatzis** *(Reviewed)*
''Oxygen bridged adduct compounds of phosphoryl chloride with metal trichlorides and pentachlorides''
*Molten Salts* **IX / ECS 94-13**: 276-283 (1994).

[6] G.M. Photiadis, **G.A. Voyiatzis**, G.J. Kipouros, and G.N. Papatheodorou *(Reviewed)*
"Raman Spectroscopic Study of $NdCl_3$-ACl (A=Li, Na, K, CA) Systems in the Solid and Liquid State"
*Proc. Int. Harald A. Øye Symp.* 313-324 (1995).

[7] Børresen B., Haarberg G.M., Tunold R., **Voyiatzis G.**, and Papatheodorou G.N. *(Reviewed)*
"Spectroscopic and electrochemical studies of formation of dissolved metal during electrolysis in chloride melts",
*Proc. Jondal 2000 Int. Symp.*, 119-125 (2000).

[8] G. De Luca, F. Bisignano, V.G. Mavrantzas, E. Karahaliou, G. Voyiatzis, J. Hoinkis, A. Figoli
"Rejection of Low Molecular Weight Solutes by Mean of Cnts: A Quantum Mechanics and Atomistic Study"
*Procedia Engineering* **44**, 371-372 (2012).

[9] A.S. Beobide, J. Anastasopoulos, G.A. Voyiatzis, G.C. Lainioti, J. Kallitsis, K. Kouravelou
"Embedment of functionalized carbon nanotubes into water purification membrance"
*Procedia Engineering* **44**: 1918-1919 (2012).

**PUBLICATIONS IN CONFERENCE PROCEEDINGS: 125 (till 2017)**

**CONFERENCE ORAL - POSTER PRESENTATIONS: 134 (till 2017)**

# *INVITED LECTURES – SEMINARS*

*"Raman Spectroscopic Study of the Molecular Orientation of Drawn Polymers",* Series of Seminars on New Materials and Applications, Condensed Matter Hellenic Society, National Center of Scientific Research "Demokritos", Athens, Greece, May 8, 1998.

"*Molecular Orientation of Drawn Polymers using Micro-Raman Spectroscopy*", Chemical & Bio-Resource Engineering Department, University of British Columbia, Vancouver, Canada, October 29, 1999.

"*Raman Spectroscopy in Materials Characterization*", Institute of Solid State and Radiochemistry, Attila Jozsef University, Szeged, Hungary, November 22, 2001.

**"***Design and Development of a pilot-probe for quality control in industrial processes*", Series of Human Network Seminars on Industrial applications of Composite Materials, Athens University Zografou Campus, Athens, Greece, January 12, 2001.

"*Spectroscopic study of ocular diseases and drug molecules detection*", FORTH/ICE-HT, Rio-Patras, Greece, May 5, 2004.

"*Characterization of Polymer Electrolyte Membranes for Fuel Cells Applications",* Series of Seminars on the Application of Fuel Cells in Stationary Systems and Transport – Energy Technologies for Viable Development, FORTH/ICE-HT, Patras, Greece, May 18, 2004.

"*Membrane modification by drawing - Estimation of the molecular orientation*", NanoMemCourse, University of Zaragoza, Zaragoza, Spain, November 13, 2007.

"*Characterization of High Temperature Polymer Electrolyte Membranes*", Institute of Chemical Technology Prague (ICTP), Prague, Czech Republic, February 5, 2008.

"*Spectroscopic non-invasive methods of chemical analysis*", Series of Seminars on Chemistry at the 21st Century, Conference and Cultural Center of the University of Patras, Rio-Patras, Greece, February 29, 2008.

"*The Raman spectroscopy as non-invasive analytical method*", Series of Seminars on New Technology & Research, Hotel Astir, Patras, Greece, April 12, 2008.

"*Antimicrobial crosslinked polystyrene nanospheres for specialty multifunctional textile production",* 4th International Intensive course & workshop:Nanomedicines-Nanoparticulates for Drug Delivery, Conference and Cultural Center of the University of Patras, Rio-Patras, Greece, September 19, 2008.

*"Bioanalytical applications of the Surface Enhanced Raman Scattering (SERS): an introduction",* Biomedical and Biotechnological Applications Research Network 2nd Meeting, Univercity of Patras Conference Center, Patras, Greece, December 16, 2010.

*"Polarized Raman spectra: opportunities & challenges – What about polarized SERS?*" 32nd European Congress on Molecular Spectroscopy (EUCMOS 2014) held at the Heinrich-Heine-University, Düsseldorf, Germany August 24-29, 2014.

*"Development of polymeric water purification membranes by incorporation of carbon nanotubes"* FORTH/ICE-HT, Rio-Patras, Greece, January 12, 2015.

"*The challenging Carbon Nanotubes' Embedment into Polymeric Membranes for Waste-Water Treatment*" COST Action MP1202: Rational design of hybrid organic-inorganic interfaces: the next step towards advanced functional materials. HINT Scientific Work-shop on Nanostructured Hybrid Materials II: reinforced 3D structures, smart composites, self-healing, Heraklion Crete, Greece, April 22, 2015.

"*Optimizing SERS conditions, by noble metal film's thermal dewetting and chemically assisted processes, for (nano)materials characterization*" Advanced Architectures in Photonics 2016 conference (AAP-2016)**,** Mykonos Island, Greece, 27 September, 2016.

*"Nanocomposites with enhanced (?) Flame-Retardant properties"* Eurofillers – Polymer Blends 2017 conference" Hersonissos Crete, Greece, April 2017.

*"Development of specialty spectroscopic probes & innovative on-line monitoring methods for characterization and quantification of molecular active agents"* Seminar at the Institute of Precision Medicine, IPM, Furtwangen University, Campus Schwenningen, Germany, October 23, 2018

# *ORGANIZATION OF SCIENTIFIC MEETINGS*

Member of the Organizing Committee:

1. "1990 EUCHEM Conference on Molten Salts", Patras, September 1990.
2. "Work-shop on Polymer Science", Patras, November 1993.
3. "Fourth Panhellenic Conference on Polymers", Patras, November 1997.
4. "The International George Papatheodorou Symposium", Patras, September 1999.
5. "The 3rd Panhellenic Scientific Conference on Chemical Engineering", Athens, May 2001.
6. "6th Hellenic Conference on Polymers", Patras, November 2006.
7. "4th International Conference on Advanced Vibrational Spectroscopy", Corfu, Greece, June 2007.
8. "10th Panhellenic Conference on Polymers", Patras, December 2014.
9. "Advanced Architectures in Photonics – 2016" Myconos, Greece, September 2016.
10. "Eurofillers – Polymer Blends 2017 conference" Hersonissos Crete, Greece, April 2017.
11. "AUTEX-2017 World Textile conference" Corfu, Greece, May 2017.

Member of the (International) Scientific Committee

1. "15th European Symposium on Polymer Spectroscopy", Crete, Greece, June 2003
2. "International Conference on Application of Nanotechnology in Membranes for Water Treatment" NanoMemWater, Izmir, Turkey, October 2013.
3. "COST MP0902 Final Meeting", Crete, Greece, October 2013.
4. "10th Panhellenic Conference on Polymers", Patras, December 2014.
5. "11th Panhellenic Conference on Polymers", Herackion Crete, Greece, November 2016.
6. "Aegean International Textile and Advanced Engineering Conference" (AITAE 2018), 2018 IOP Conf. Ser.: Mater. Sci. Eng. 459 011002, Mytilene, Lesvos, Greece, September 2018.

Editorship of Scientific Conference Proceedings

1. "Fourth Panhellenic Conference on Polymers", Patras, November 1997.
2. "The International George Papatheodorou Symposium", Patras, September 1999
   (ISBN: 960-7839-01-3)

# *PATENTS*

## *Granted*

1.

| | |
|---|---|
| Title: | "Acid Impregnated Polymeric Membranes for Use as Solid Electrolytes" |
| Appl. No.: | 990100451/30.12.1999 (Hellenic Patent Application) |
| Patent No.: | 1003647/30.8.01 |
| Inventors: | C. Hasiotis, J. Kallitsis, V. Deimede, **G. Voyiatzis**, C. Kontoyiannis, G. Papatheodorou |
| Valid in: | Greece till 31-12-2019 |
| Depositor | FORTH/ICE-HT |

2.[10]

| | |
|---|---|
| Title: | "Controlled release of antimicrobial substances from polymer matrices" |
| Appl. No.: | 20030100081/14.02.2003 (Hellenic Patent Application) |
| Patent No.: | 1004764 – 16.12.04 |
| Inventors: | I. Kallitsis, S. Iconomopoulou, A. Soto-Beobide, **G. Voyiatzis**, K. Andreopoulou, Ch. Katsichtis, E. Tsartolia, A. Papadopoulos |
| Valid in: | Greece till 15-2-2023 |
| Depositors | FORTH/ICE-HT & ARGO S.A. |

3.

| | |
|---|---|
| Title: | "Antimicrobial and antifouling properties of polymer blends based on polystyrene sulfonated phosphonium salts combined with various polymer matrixes" |
| Appl. No.: | GR20050100499 (Hellenic Patent Application) |
| Patent No.: | 1005443 – 15-2-2007 |
| Inventors: | S.M. Iconomopoulou, A.K. Andreopoulou, C. Papadopoulou, E.K. Ikonomou, Ch. Katsichtis, **G.A. Voyiatzis**, J.K. Kallitsis |
| Valid in: | Greece till 28-09-20025 |
| Depositors | FORTH/ICE-HT & ARGO S.A. |

## *Withdrawn*

1.[11]

| | |
|---|---|
| Title: | "Controlled release of antimicrobial substances from polymer matrices" |
| Appl. No.: | 04386006.3/13.02.2004 (European Patent Application) |
| *Patent number*: | EP1460089 |
| *Publication date*: | 22.09.2004 |
| Withdrawal of application: | 31.01.2007 |
| Reason: | Renewal fee not paid in time |
| Inventors: | I. Kallitsis, S. Iconomopoulou, A. Soto-Beobide, **G. Voyiatzis**, K. Andreopoulou, Ch. Katsichtis, E. Tsartolia, A. Papadopoulos |
| Depositors | FORTH/ICE-HT & ARGO S.A. |

[10] With a Search Report with only 1 (one) relevant document of technological background (Category A)
[11] With a Search Report with only 1 (one) relevant document of technological background (Category A)

## *Impact factor* of scientific journals

| A/A | *[12] | JOURNAL | No. | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|---|---|---|---|
| 1. | | ACTA CHEM SCAND | 2 | - | - | - | - | - | - | - |
| 2. | * | ADV DEV MATER | 1 | | | | N/A | ceased | - | - |
| 3. | | ADV MATER INTERFACES | 1 | - | 3,365 | 2,800 | 4,834 | 4,713 | 4,948 | 6,147 |
| 4. | * | ANALYST | 1 | 4,107 | 4,033 | 3,885 | 3,864 | 4,019 | 3,978 | 4,616 |
| 5. | | APPL CATAL B-ENVIRON | 1 | 7,435 | 8,328 | 9,446 | 11,698 | 14,229 | 16,683 | 19,503 |
| 6. | ** | APPL SPECTROSC | 2 | 1,875 | 1,798 | 2,014 | 1,642 | 2,064 | 2,087 | 2,193 |
| 7. | | BER BUNSEN PHYS CHEM[13] | 2 | - | - | - | - | - | - | |
| 8. | | BIOMATERIALS | 1 | 8,557 | 8,387 | 8,402 | 8,806 | 10,273 | 10,317 | 12,479 |
| 9. | * | CARBON | 1 | 6,196 | 6,198 | 6,337 | 7,082 | 7,466 | 8,821 | 9,594 |
| 10. | | CATAL TODAY | 1 | 3,893 | 4,312 | 4,636 | 4,667 | 4,888 | 5,825 | 6,766 |
| 11. | | CHEMCATCHEM | 1 | 4,556 | 4,724 | 4,803 | 4,674 | 4,495 | 4,853 | 5,686 |
| 12. | | CHEM PHYS LETT | 1 | 1,897 | 1,860 | 1,815 | 1,686 | 1,901 | 2,029 | 2,328 |
| 13. | * | COLLOIDS SURF A: PHYSICOCHEM ENG ASP | 1 | 2,354 | 2,760 | 2,760 | 2,714 | 2,829 | 3,990 | 4,539 |
| 14. | | CURR EYE RES | 1 | 1,639 | 2,025 | 2,238 | 2,120 | 1,672 | 1,754 | 2,424 |
| 15. | | DENT MATER | 1 | 3,769 | 3,931 | 4,070 | 4,039 | 4,440 | 4,495 | 5,304 |
| 16. | | DENT MATER J | 1 | 0,968 | 1,087 | 1,073 | 1,205 | 1,424 | 1,359 | 2,102 |
| 17. | | EXPRESS POLYM LETT | 1 | 2.761 | 2.965 | 2,983 | 3,064 | 2,875 | 3,083 | 4,161 |
| 18. | | HYDROMETALLURGY | 1 | 1,933 | 2,290 | 2,605 | 3,300 | 3,465 | 3,338 | 4,156 |
| 19. | * | INORG CHEM | 7 | 4,762 | 4,820 | 4,857 | 4,700 | 4,850 | 4,825 | 5,165 |
| 20. | | INT J PHARMACEUT | 1 | 3,650 | 3,994 | 3,649 | 3,862 | 4,213 | 4,845 | 5,875 |
| 21. | | J APPL ELECTROCHEM | 1 | 2,409 | 2,223 | 2,235 | 2,262 | 2,366 | 2,384 | 2,800 |
| 22. | | J APPL PHYS | 1 | 2,183 | 2,101 | 2,068 | 2,176 | 2,328 | 2,286 | 2,546 |
| 23. | * | J APPL POLY SCI | 1 | 1.768 | 1.866 | 1,860 | 1,900 | 2,188 | 2,520 | 3,125 |
| 24. | * | J BIOMED OPT | 1 | 2,859 | 2,556 | 2,530 | 2,367 | 2,555 | 2,785 | 3,170 |
| 25. | | J BIOTECHNOL BIOMATER | 1 | - | (2,0) | 1,750 | 1,750 | 1,750 | 1,750 | 1,750; |
| 26. | | J CATAL | 2 | 6,921 | 7,354 | 6,844 | 6,759 | 7,723 | 7,888 | 7,920 |
| 27. | | J CHEM PHYS | 1 | 2,952 | 2,894 | 2,965 | 2,843 | 2,997 | 2,991 | 3,488 |
| 28. | * | (J CHEM S) DALTON TRANS | 2 | 4,197 | 4,177 | 4,029 | 4,099 | 4,052 | 4,174 | 4,390 |
| 29. | | J COLLOID INTERF SCI | 1 | 3,368 | 3,782 | 4,233 | 5,091 | 6,361 | 7,489 | 8,128 |
| 30. | ** | J CONTROL RELEASE | 2 | 7,705 | 7,441 | 7,786 | 7,877 | 7,901 | 7,727 | 9,776 |
| 31. | | J CRYST GROWTH | 1 | 1,698 | 1,462 | 1,751 | 1,742 | 1,573 | 1,632 | 1,797 |
| 32. | | J IND TEXT | 1 | 1,349 | 1,120 | 1,750 | 1,283 | 1,884 | 2,010 | 3,721 |
| 33. | | J INORG BIOCHEM | 1 | 3,444 | 3,205 | 3,348 | 3,063 | 3,224 | 3,212 | 4,155 |
| 34. | | J MAT CHEM A | 1 | 7,443 | 8,262 | 8,867 | 9,931 | 10,733 | 11,301 | 12,732 |
| 35. | * | J MEMBRANE SCI | 2 | 5,056 | 5,557 | 6,035 | 6,578 | 7,015 | 7,183 | 8,742 |
| 36. | | J MOL STRUCT | 1 | 1,602 | 1,780 | 1,753 | 2,011 | 2,120 | 2,463 | 3,196 |
| 37. | | J PHYS CHEM B | 1 | 3,302 | 3,187 | 3,177 | 3,146 | 2,923 | 2,857 | 2,991 |
| 38. | | J PHYS CHEM C | 2 | 4,772 | 4,509 | 4,536 | 4,484 | 4,309 | 4,189 | 4,126 |
| 39. | | J PHYS-CONDENS MAT | 1 | 2,346 | 2,209 | 2,649 | 2,617 | 2,711 | 2,707 | 2,333 |
| 40. | * | J POLYM SCI (POL PHYS)[14] | 2 | 3,830 | 3,318 | 2,838 | 2,499 | 2,596 | 2,499 | 2,435 |
| 41. | ***** | J RAMAN SPECTROSC | 6 | 2,671 | 2,395 | 2,969 | 2,879 | 2,809 | 2,000 | 3,133 |
| 42. | * | LASER SURG MED | 1 | 2,619 | 2,135 | 2,312 | 2,726 | 3,262 | 3,020 | 4,025 |
| 43. | | MACROM MATER ENG | 1 | 2,661 | 2,834 | 2,863 | 2,690 | 3,038 | 3,853 | 4,367 |
| 44. | | MACROMOL RAPID COMM | 1 | 4,941 | 4,638 | 4,265 | 4,441 | 4,078 | 4,886 | 5,734 |
| 45. | * | MACROMOL SYMP[15] | 1 | 0,700 | 0,670 | 0.734 | 0.577 | 0.624 | 0.692 | 0,858 |
| 46. | *** | MACROMOLECULES | 8 | 5,800 | 5,554 | 5,835 | 5,914 | 5,997 | 5,918 | 5,985 |
| 47. | ** | MOLECULES | 2 | 2,416 | 2,465 | 2,861 | 3,098 | 3,060 | 3,267 | 4,411 |
| 48. | | PHYS CHEM CHEM PHYS | 2 | 4,493 | 4,449 | 4,123 | 3,906 | 3,567 | 3,430 | 3,676 |
| 49. | | PHYS LETT A | 1 | 1,683 | 1,677 | 1,772 | 1,863 | 2,087 | 2,278 | 2,654 |
| 50. | | PHYS REV B | 1 | 3,736 | 3,718 | 3,836 | 3,813 | 3,736 | 3,575 | 4,036 |
| 51. | | PLOS[16] ONE | 1 | 3,234 | 3,057 | 2,806 | 2,766 | 2,776 | 2,740 | 3,240 |
| 52. | | POLYHEDRON | 2 | 2,011 | 2,108 | 1,926 | 2,067 | 2,284 | 2,343 | 3,052 |
| 53. | | POLYMER | 1 | 3,562 | 3,586 | 3,684 | 3,483 | 3,771 | 4,231 | 4,430 |
| 54. | | POLYM ENG SCI | 1 | 1.520 | 1.719 | 1,449 | 1,551 | 1,920 | 1,917 | 2,428 |
| 55. | ** | POLYMERS | 3 | 3.681 | 2.944 | 3,364 | 2,935 | 3,164 | 3,426 | 4,329 |
| 56. | | POWDER METALL MET C+ | 1 | 0,219 | 0,235 | 0,342 | 0,326 | 0,381 | 0,388 | 0,511 |
| 57. | | RISK ANAL | 1 | 2,502 | 2,225 | 2,518 | 2,898 | 2,564 | 3,137 | 4,000 |
| 58. | * | RPDDF | 1 | - | 1,06[17] | 1,13[18] | | | 1,250[19] | 1,730 |
| 59. | | RSC ADVANCES | 1 | 3,840 | 3,289 | 3,108 | 2,936 | 3,049 | 3,119 | 3,361 |
| 60. | * | SCI REP | 1 | 5,578 | 5,288 | 4,259 | 4,122 | 4,011 | 3,998 | 4,379 |
| 61. | | SENSOR ACTUAT B-CHEM | 1 | 4,097 | 4,758 | 5,401 | 5,667 | 6,393 | 7,100 | 7,460 |
| 62. | | SOL ENERG MATER SOL C | 1 | 5,337 | 4,732 | 4,784 | 5,667 | 5,018 | 6,984 | 7,267 |
| 63. | | THIN SOLID FILMS | 1 | 1,759 | 1,761 | 1,879 | 1,939 | 1,888 | 2,030 | 2,183 |
| 64. | | VIB SPECTROSC | 1 | 2,003 | 1,682 | 1,740 | 1,363 | 1,861 | 1,917 | 2,507 |
| | 31 | | 96 | | | | | | | |
| | | **Overal Impact Factor:** | | | | | | | | |

[12] * Corresponding author
[13] Last impact factor 2000 (1,531)
[14] J POLYM SCI since Jan 2020
[15] Last JCR impact factor 2005 (0,913)
[16] PLOS does not consider Impact Factor to be a reliable or useful metric to assess the performance of individual articles. PLOS supports DORA – the San Francisco Declaration on Research Assessment – and does not promote our journal Impact Factors
[17] Scopus CiteScore Metrics
[18] Research Gate Impact Factor
[19] Scopus cite score metrics for *Recent Patents on Drug Delivery & Formulation*; Journal released in 2007