

APRIL 18, 2015

BRIEF CURRICULUM VITAE



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A senior academic, research scientist, program manager and industry consultant with extensive North American and International experience. Many years of close collaboration with Canadian, American, Japanese, Chinese, Russian, and European scientists, and working sabbaticals in France, Italy, Switzerland and the United States, have given him an intimate knowledge of the working relationships between Academia, Industry and Government agencies in various countries. As Program Director at the U.S. National Science Foundation (1998–2001), Arlington, VA, he co-managed and recommended funding for many of America’s most brilliant researchers. A prolific editor and contributor to numerous books and journals, with over 410 papers published in a variety of prestigious journals, he was the 1997 recipient of the “Best Paper Award” from the Society for Imaging Science and Technology. An Industry Consultant, he has had a long and fruitful relationship with the 3M Company in the United States and was the founding partner and Vice-President of a company established (with David Ollis of NCSU) to develop a commercial technology for environmental pollution abatement. A skilled organizer, efficient, professional and analytical, he has chaired numerous Organizing Committees, Review Panels and Appeal Boards at the Provincial, National and International (NSF & DOE) levels, and was a member of a Task Force of the U.S. National Academy of Sciences (1990–1991). He has been a member of the Major Resources Support Committee for the Natural Sciences and Engineering Research Council of Canada (2007–2010) to evaluate and adjudicate proposals of thematic and physical resources. He is also a Guest Editor for the Journal of Advanced Oxidation Technologies and Applied Catalysis B (2009–2010). Fluently trilingual, written and spoken, and an effective communicator, both horizontally and vertically, he has also been a frequent Keynote Address Speaker and Invited Plenary Lecturer. In 2010 he was elected to be a Fellow of the European Academy of Sciences (EurASc; Division of Material Sciences) and since 2012 is a Member of its Scientific Committee. On March 1, 2014 he was elected Head of the Materials Sciences Division and Member of the Academic Council of EurASc.

PROFESSIONAL HISTORY

ELECTED FELLOW, EUROPEAN ACADEMY OF SCIENCES 2010 -....
MEMBER OF SCIENTIFIC COMMITTEE, MATERIAL SCIENCES DIVISION 2012-.....
HEAD OF MATERIALS SCIENCES DIVISION MARCH 1, 2014-...
MEMBER OF ACADEMIC COUNCIL MARCH 1, 2014-...

VISITING PROFESSOR, TOKYO UNIVERSITY OF SCIENCE, JULY-AUGUST 2008
NODA CAMPUS, CHIBA PREFECTURE, JAPAN
Department of Chemistry

Gave lectures to Ph.D. Students and Faculty on our recent research on Sunscreens, Prebiotic Chemistry, and Heterogeneous Photocatalysis. Also gave lectures at the University of Tokyo, Osaka University, and Shiseido Cosmetics Co. (Yokohama).

MEMBER OF MAJOR RESOURCES SUPPORT COMMITTEE JULY 2007–JUNE 2010
Natural Sciences and Engineering Research Council of Canada

Reviewed several proposals and adjudicated support for Physical and Thematic Resources in Canada.

CONSULTANT JANUARY 2005 - ...
Italy & Canada
Green Chemistry, Photocatalysis, Photochemistry

PROFESSORE A CONTRATTO (RIENTRO DEI CERVELLI) DEC. 2002–MAY 2005
VISITING PROFESSOR JUNE 2005 – ...
Dipartimento di Chimica, Universita di Pavia, Italy

Taught 3 courses on Catalysis, Photocatalysis, and Molecular Spectroscopy during the winter semesters to Ph.D. students (2002-2005).

Carried out active research into the photochemistry of sunscreen active agents and prebiotic chemistry with Prof. Angelo Albini and his group (2002-....)

UNIVERSITY RESEARCH PROFESSOR JUNE 1998 – MAY 2004
PROFESSOR EMERITUS JUNE 2000 –
Concordia University, Montreal, Quebec

Directed vigorous research program as attested by publications and presentations at conferences/ colloquia/ symposia and seminars.

Collaborated actively in the recent past in areas such as

- Photobiology and photochemistry of sunscreens with investigators at the University of Oxford, UK (Prof. J. Knowland), and University of Pavia, Italy (Prof. A. Albini),
- Environmental chemistry with colleagues at Meisei University (Prof. H. Hidaka), and Sophia University and the Tokyo University of Science (Prof. S. Horikoshi), Japan, and at the Chinese Academy of Sciences (Prof. J. Zhao), Beijing, China,
- Materials research with scientists at the Institute of Physics of the State University of St. Petersburg, Russia (Prof. V.K. Ryabchuck, Dr. V.N. Kuznetsov, and Prof. A.V. Emeline).

PROGRAM DIRECTOR
National Science Foundation, Arlington, VA, USA

SEPT. 1998 – JULY 2001

Responsible for managing research proposals in Inorganic, Bioinorganic & Organometallic Chemistry, and co-managing funding of US \$20 M annually.

- Provided optimal support for best projects; exercised appropriate scientific judgment and consistency in award and declination process;
- Balanced appropriate sub-fields and institutions;
- Promoted participation of all qualified scientists;
- Prepared proposal recommendations and provided documentation in line with Divisional and Foundation practices and policies and made recommendations regarding funding levels.
- Communicated verbally results of review process and appropriate recommendations with all principal investigators. Advised declined investigators on strategies for winning proposals.
- Participated in review process and site visit panel for Science & Technology Centers.
- Assisted, participated and chaired internal CRIF/MRI (instrumentation) Panels, CAREER Panels for young principal investigators, and Panels for marginal Proposals.
- Traveled to Tokyo to meet with staff of NSF's Office in Japan and delivered two plenary lectures at University of Tokyo and at Meisei University.
- Maintained active research program while at NSF.

ASSISTANT PROFESSOR
ASSOCIATE PROFESSOR
PROFESSOR

JUNE 1968 – MAY 1973
JUNE 1973 – MAY 1980
JUNE 1980 – MAY 1998

Dept. of Chemistry & Biochemistry, Concordia University, Montreal, Canada

- **Teacher, Research Scientist & Mentor** to undergraduate and graduate students, post-doctoral associates, and several visiting scientists.
- **Recipient of research funding** (35 years) from NRC, NSERC, NATO, France-Quebec Exchange Program, and FCAC Quebec; and from MIUR (Roma, Italy).
- **Chairman & Member** of numerous committees internal and external to the university and at the local and international level.
- **Member, Canada Advisory Committee** on ISO/TC206 (as of July 2003)
- **Associate Member**, Commission on Photochemistry, International Union of Pure & Applied Chemistry (1997-2000), and member of the sub-Committee on Photochemistry (2000 -2008).
- **Chairman** (1986-1987) and member of Concordia University Faculty Appeals Board (1978-1987).
- **Membre de la Commission d'Évaluation** des projets de programmes universitaires, Conférence des Recteurs et des Principaux des Universités du Québec (1993-1994).
- **Membre du Comité d'Évaluations** des échanges Québec-Flandres et Québec-Italie, Ministère des Affaires Internationales du Québec (1993 - 1994).
- **Membre du Jury d'Évaluation** #32, FCAC, Québec, Bourses d'Études Supérieures (1978 - 1981)
- **Président** (1985-1986) **et membre** (1984 - 1987) Comité des Subventions #04, FCAR, Québec
- **Membre**, Comité des Examineurs, Ordre des Chimistes du Québec (1977 - 1979)
- **Président**, Comité Expérience, Ordre des Chimistes du Québec (1979 - 1981)
- **Co-Organizer** (with Ezio Pelizzetti) NATO Advanced Research Workshop, Italy, 1985.
- **Councilor**, Division of Inorganic Chemistry, Chemical Institute of Canada, Ottawa (1983 - 1985).
- **Best Paper Award** (with Mel Sahyun & Boris Levy), Society of Imaging Science & Technology, May 1997.
- **Listed as # 892** in a list of most cited chemists in the world (out of about 0.5 million)
- **Associate Editor** for the Journal of Advanced Oxidation Technologies (1994-2004)
- **Guest Editor**, *Journal of Advanced Oxidation Technologies* (2006-2007 & 2009-2010).
- **Guest Editor**, *Applied Catalysis B:Environmental*, 2009-2010.

EDUCATION

Ph.D, *Physical Inorganic Chemistry* **1964 -1968**
Cornell University, Ithaca, N.Y., USA
Fellowships & Scholarships

- National Research Council of Canada Pre-doctoral Fellowship, Cornell University 1966 - 1968
- Cornell University Graduate Fellowship, Cornell University, 1965-1966.
- Woodrow Wilson Foundation Fellowship, Cornell University, 1964-1965.

B.Sc., *Honors Chemistry* **1960 -1964**
Sir George Williams University, Montreal, Canada

Awards

- Chemical Institute of Canada Prize 1963.
- Chemical Industries Limited Prize 1964.
- Mappin Medal, for Highest Academic Standing in Science, 1964.
- Society of the Chemical Industry Gold Key Award 1964.

SPECIAL SKILLS AND OTHER ACCOMPLISHMENTS

- **Fluently trilingual**, written and spoken: English, French, and Italian. Reading knowledge of Spanish, Portuguese (and some German).
- **Président fondateur**, Comité des Chimistes à l'Entraînement, Ordre des Chimistes du Québec (1979 - 1981).
- **Founder & Director of the National Center for Fast Laser Spectroscopy**, Concordia University (1981-1987 & 1993 - 2001).
- **Chairman, Review Panel for U.S. Department of Energy**, Office of Basic Energy Sciences (Washington).
- **Founding partner and vice-president R&D**, Photolytics Inc., Chapel Hill, NC (1987-1992). Made contacts and sought venture capital funding to establish and develop a commercial technology for environmental pollution abatement.
- **Collaborator & Consultant**, 3M Company (St Paul, Minnesota, USA) in understanding the silver halide imaging process (1986-1996).
- **Visiting Professor**, Laboratorio di Fotochimica, Università di Bologna, Bologna, Italy (1975 - 1976).
- **Visiting Associate Professor**, Department of Chemistry, Boston University, Summer 1978 and Spring Semester 1979.
- **Visiting Scientist**, Department of Chemistry, Brookhaven National Laboratory, Upton, NY, summers of 1979 and 1980; and April - October 1981.
- **Professeur Invite**, Ecole Polytechnique Fédérale de Lausanne, Suisse (1983-1984).
- **Directeur de Recherche**, Ecole Centrale de Lyon, Lyon, France (1990-1991).
- **Visiting Professor**, Università di Ferrara, Ferrara, Italy (1997-1998)
- **Member Task Force of the U.S. National Academy of Sciences** (1990-1991) to study applications of Solar Furnaces. As part of study, toured several selected European laboratories with interests in high temperature photochemistry.
- **Member of Review Panel of U.S Department of Energy**. CRADA projects (Seattle, WA. 1996-1997).
- **Program Director**, Inorganic, Bio-Inorganic & Organometallic Chemistry program, Division of Chemistry, U.S. National Science Foundation, Arlington, VA (Sept.1998 – July 2001).
- **Member, Major Resources Support Committee**, Natural Sciences and Engineering Research Council of Canada, Ottawa (June 2007 – June 2010).

PATENTS

"Procédé de sensibilisation d'un photocatalyseur d'oxydoréduction et photocatalyseur ainsi obtenu".

Inventeurs: Michael Gratzel, EPFL, Lausanne, Suisse.
Nick Serpone, EPFL, Lausanne, Suisse.
Dung Duonghong, EPFL, Lausanne, Suisse.

Brevet Suisse No. 2113/84.

"Process for the Sensitization of Oxidation/Reduction Photocatalyst and Photocatalyst thus Obtained".

Inventors: M. Gratzel, EPFL Lausanne, Suisse
N. Serpone, EPFL Lausanne, Suisse
D. Duonghong, EPFL Lausanne, Suisse

U.S. Patent No. 4,684,537 of August 4, 1987.

TEACHING EXPERIENCE

- General Chemistry: **9 years** (up to 350 students/year - from 1970 to 1979).
- Introduction to Inorganic Chemistry: **12 years**.
- Chemistry of the Main Group Elements: **9 years**.
- Transition Metal Chemistry: **16 years**.
- Physical Methods in Inorganic Chemistry: **6 years**.
- Chemical Applications of Group Theory: **7 years (graduate course)**.
- Inorganic Photochemistry: **6 years (graduate course)**.
- Advanced Inorganic Chemistry: **2 years (graduate course)**.
- Kinetics & Mechanisms of Inorganic Reactions: **2 years (graduate course)**.
- Introduction to and Applications of Semiconductors: **2 years (graduate course)**.
- Heterogeneous Photocatalysis: **1 year (graduate course)**.
- General Chemistry: **4 years** (about 200 students total each year: 1994 - 1998)
- Molecular Spectroscopy through Elements of Symmetry – **1 year Graduate Course** (Pavia, January-March, 2003).
- Homogeneous and Heterogeneous Catalysis – **2 years** (University of Pavia, January to April 2004 and 2005).

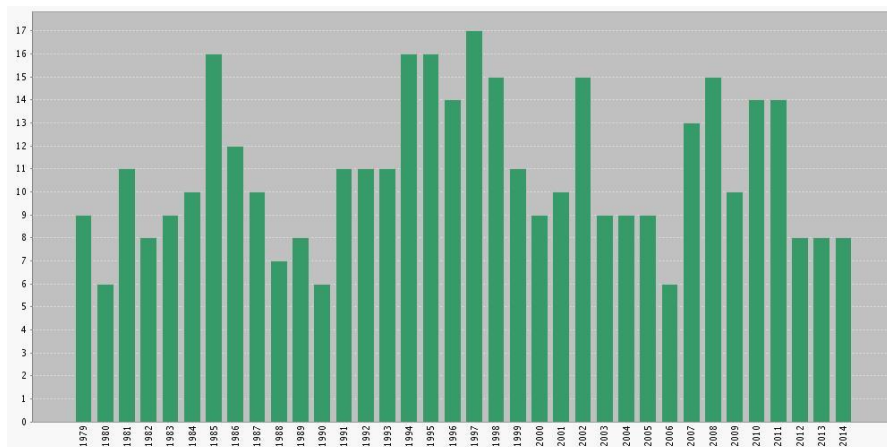
Top 10 most cited articles by N. Serpone (Scopus and Google)

<i>TOP 10 Papers (as of February 2015 from Google Database)</i>	<i>No. of citations</i>	<i>Year of publ</i>
Photocatalysis: fundamentals and applications N. Serpone, E. Pelizzetti (Eds.), Wiley	1433	1989
Photocatalyzed destruction of water contaminants DF Ollis, E Pelizzetti, N Serpone, <i>Environmental science & technology</i> 25 (9), 1522-1529	1300	1991
Size effects on the photophysical properties of colloidal anatase TiO₂ particles: size quantization versus direct transitions in this indirect semiconductor? N Serpone, D Lawless, R Khairutdinov, <i>The Journal of Physical Chemistry</i> 99 (45), 16646-16654	970	1995
Kinetics studies in heterogeneous photocatalysis. I. Photocatalytic degradation of chlorinated phenols in aerated aqueous solutions over titania supported on a glass matrix H Al-Ekabi, N Serpone, <i>The Journal of Physical Chemistry</i> 92 (20), 5726-5731	609	1988

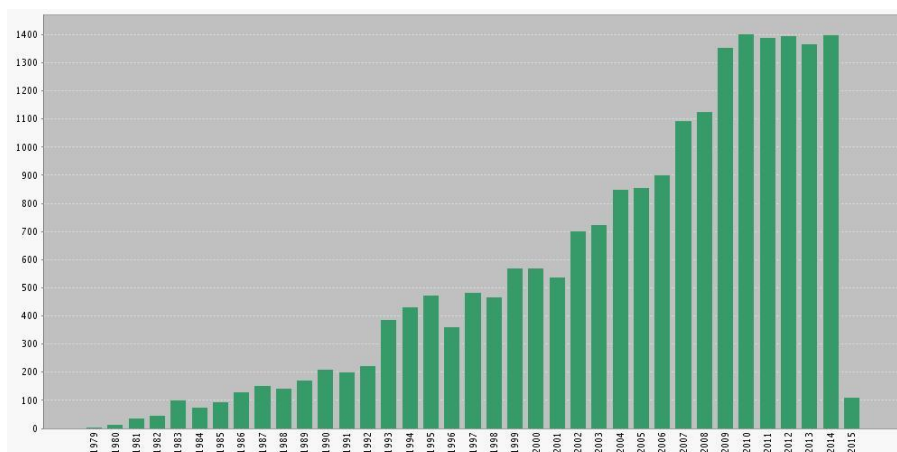
<i>Charge carrier trapping and recombination dynamics in small semiconductor particles</i> G Rothenberger, J Moser, M Graetzel, N Serpone, DK Sharma, <i>Journal of the American Chemical Society</i> 107 (26), 8054-8059	545	1985
<i>Photoassisted degradation of dye pollutants. V. Self-photosensitized oxidative transformation of rhodamine B under visible light irradiation in aqueous TiO₂ dispersions</i> T Wu, G Liu, J Zhao, H Hidaka, N Serpone, <i>The Journal of Physical Chemistry B</i> 102 (30), 5845-5851	620	1998
<i>Exploiting the interparticle electron transfer process in the photo-catalysed oxidation of phenol, 2-chlorophenol and pentachlorophenol: chemical evidence for electron and hole transfer between coupled semiconductors</i> N Serpone, P Maruthamuthu, P Pichat, E Pelizzetti, H Hidaka, <i>Journal of Photochemistry and Photobiology A: Chemistry</i> 85 (3), 247-255	513	1995
<i>Is the band gap of pristine TiO₂ narrowed by anion-and cation-doping of titanium dioxide in second-generation photocatalysts?</i> N Serpone, <i>The Journal of Physical Chemistry B</i> 110 (48), 24287-24293 (Feature Article)	561	2006
<i>Chemical oxidation and DNA damage catalysed by inorganic sunscreen ingredients</i> R Dunford, A Salinaro, L Cai, N Serpone, S Horikoshi, H Hidaka, J Knowland, <i>FEBS Letters</i> 418 (1), 87-90	452	1997
<i>Photoassisted degradation of dye pollutants. 3. Degradation of the cationic dye rhodamine B in aqueous anionic surfactant/TiO₂ dispersions under visible light irradiation: Evidence for the need of substrate adsorption on TiO₂ particles</i> J Zhao, T Wu, K Wu, K Oikawa, H Hidaka, N Serpone, <i>Environmental Science & Technology</i> 32 (16), 2394-2400	442	1998

Statistical Research Results from the Web of Science (accessed February 2015)

Published Items in Each Year



of citations in Each Year



Only last 20 years (1995 – 2015) are displayed.

Google Scholar database reveals following (APRIL 18, 2015): UPDATED Citation indices

	All	Since 2010
Citations	28039	10521
h-index	85	48
i10-index	314	188

Areas of Expertise

- **Photochemistry and photophysics of Coordination Compounds** (1975 -Subsequent to a year sabbatic leave spent at the Laboratory of Prof. Vincenzo Balzani, University of Bologna, Italy 1975-1976).
- **Fast laser spectroscopy** from psec to nsec of semiconductor materials (e.g. CdS, TiO₂,...) to identify electron transfer to and from electron acceptors and donors (1983 -).
- **Applied Heterogeneous Photocatalysis** on environmental pollutants (1983-... subsequent to a year spent in the Laboratory of Prof. Michael Graetzel, Ecole Polytechnique Federale de Lausanne, Switzerland 1983-1984 and in Dr. Pierre Pichat Laboratory at the Ecole Centrale de Lyon, France, 1990-1991).
- **Fundamentals of Heterogeneous Photocatalysis** – by the early 1990s it became evident that there was a need to systematize this field. We thus began by examining closely the primary events occurring soon after the light absorption event through fast laser spectroscopy, pulse radiolysis (at Argonne National Laboratory, USA; and at the Center for Fast Kinetics of the University of Texas at Austin).
- **Photochemistry of sunscreens** – in the mid-1990s we were made aware that TiO₂ was an important sunscreen agent present in many formulations of sun care products. Accordingly we began an examination of both so-called physical and chemical UV filters.
- **Microwave-assisted chemistry**. In the last decade we have begun examining some of the fundamentals of microwave radiation fields and their effects on organic reactions and nanoparticle syntheses. In addition, using microwave radiation we were able to activate electrodeless lamps in both the UV and visible region and apply them toward environmental issues using both UV/visible radiation and microwave radiation

Many of the above studies were carried out in collaboration with many research groups in the USA, France, Italy, Japan, and Russia.

Collaborations are continuing with groups in Tokyo, Japan, and at St. Petersburg, Russia.

PUBLICATIONS

(A) BOOKS

1. ***Microwaves in Catalysis – Methodologies and Applications***
Satoshi Horikoshi and Nick Serpone, Eds., Wiley-VCH, Weinheim, Germany, **book in progress** (publ 2015).
2. ***Chemistry – Reading and Writing the Book of Nature***
Vincenzo Balzani and Margherita Venturi (translated by Nick Serpone), The Royal Society of Chemistry, UK (September 2014).
3. ***Powering Planet Earth – Energy solutions for the future***
Nicola Armaroli, Vincenzo Balzani, and Nick Serpone, Wiley-VCH, Weinheim, Germany, March 2013, 239 pages. Available from www.amazon.it ; www.amazon.com ; www.amazon.ca
4. ***Microwaves in Nanoparticle Synthesis – Fundamentals and Applications***
Satoshi Horikoshi and Nick Serpone, Eds., Wiley-VCH, Weinheim, Germany, May 2013.
5. ***Photosensitive Metal-Organic Systems: Mechanistic Principles and Recent Applications.***
C. Kotal and **N. Serpone**, Eds., *Advances in Chemistry Series*, Vol. 238, American Chemical Society, Washington, D.C., 1993, 435 pages.
6. ***Potential Applications of Concentrated Solar Photons***
A.J. Bard, A. Heller, J. Lambert-Bates, E.M. Garmire, A.L. Goldstein, J. St.Clair Kilby, D.F. Ollis, A.F. Sarofim, **N. Serpone**, M.A. Tenhover, and V. Vaida, National Academy Press, Washington, D.C., 1991.
7. ***Photochemical Technology***
David F. Ollis and **Nick Serpone**, (book translated from the French "Technologies Photochimiques", by A. Braun et al., Presses Suisses Romandes), Wiley, London, 1991, 559 pages.
8. ***Photocatalysis - Fundamentals and Applications***
N. Serpone and E. Pelizzetti, Eds., Wiley-Interscience, New York, 1989, 650 pages.
9. ***Homogeneous and Heterogeneous Photocatalysis***
E. Pelizzetti and **N. Serpone**, Eds., NATO ASI Series, Series C: Mathematical and Physical Sciences, vol. 174, D. Reidel Publ.Co., Dordrecht, Holland, 1986.

(B) CHAPTERS IN BOOKS

22. S. Horikoshi and N. Serpone, General Introduction to Microwave Chemistry, in: ***Microwaves in Catalysis – Fundamentals and Methodologies***, S. Horikoshi, N. Serpone (Eds.), Wiley-VCH, Weinheim, Germany, 2015. Pp. xxx-yyy.
21. S. Horikoshi and N. Serpone, Managing microwave-induced hot spots in heterogeneous catalytic systems, in: ***Microwaves in Catalysis – Fundamentals and Methodologies***, S. Horikoshi, N. Serpone (Eds.), Wiley-VCH, Weinheim, Germany, 2015. Pp. xxx-yyy.
20. S. Horikoshi and N. Serpone, Preparation of heterogeneous catalysts by a microwave selective heating method, in: ***Microwaves in Catalysis – Fundamentals and Methodologies***, S. Horikoshi, N. Serpone (Eds.), Wiley-VCH, Weinheim, Germany, 2015. Pp. xxx-yyy.
19. S. Horikoshi and N. Serpone, Hydrogen evolution from organic hydrides through microwave selective heating in heterogeneous catalytic systems, in: ***Microwaves in Catalysis – Fundamentals and Methodologies***, S. Horikoshi, N. Serpone (Eds.), Wiley-VCH, Weinheim, Germany, 2015. Pp. xxx-yyy.

18. S. Horikoshi and N. Serpone, Microwave-/photo-driven photocatalytic treatment of waste waters, in: ***Microwaves in Catalysis – Fundamentals and Methodologies***, S. Horikoshi, N. Serpone (Eds.), Wiley-VCH, Weinheim, Germany, 2015. Pp. xxx-yyy.
17. S. Horikoshi and **N. Serpone**, Introduction to Nanoparticles, in ***Microwaves in Nanoparticle Synthesis – Fundamentals and Applications***, S. Horikoshi and N. Serpone, Eds., Wiley-VCH, Weinheim, Germany, **2013**, Chapter 1, pp 1-24.
16. S. Horikoshi and **N. Serpone**, General Features of Microwave Chemistry, in ***Microwaves in Nanoparticle Synthesis – Fundamentals and Applications***, S. Horikoshi and N. Serpone, Eds., Wiley-VCH, Weinheim, Germany, **2013**, Chapter 2, pp 25-37.
15. S. Horikoshi and **N. Serpone**, Considerations of Microwave Heating, in ***Microwaves in Nanoparticle Synthesis – Fundamentals and Applications***, S. Horikoshi and N. Serpone, Eds., Wiley-VCH, Weinheim, Germany, **2013**, Chapter 3, pp 39-54.
14. S. Horikoshi and **N. Serpone**, Nanoparticle Synthesis through Microwave Heating, in ***Microwaves in Nanoparticle Synthesis – Fundamentals and Applications***, S. Horikoshi and **N. Serpone**, Eds., Wiley-VCH, Weinheim, Germany, **2013**, Chapter 5, pp 75-105.
13. A.V. Emeline, V.N. Kuznetsov, V.K. Ryabchuk, and **N. Serpone**, Heterogeneous Photocatalysis – Basic approaches and terminology, in ***New and Future Developments in Catalysis: Solar Photocatalysis***, S.L. Suib, Ed., Wiley-VCH, Weinheim, Germany, **2013**, chapter 1. pp. 1-35.
12. S. Horikoshi and **N. Serpone**, Microwave frequency effects in organic synthesis, in ***Microwaves in Organic Synthesis***, A. de la Hoz and A. Loupy, Eds., Wiley-VCH, Weinheim, Germany, **2012**, vol. 1, 3rd edn., chapter X, pp. 377–423.
11. **N. Serpone** and A.V. Emeline, Solar Photocatalysis I. The Fundamental Science Underlying Metal-Oxide Heterogeneous Photocatalysis, in ***Photoconversion of Solar Energy – Photochemical and Photoelectrochemical Approaches***, M.D. Archer and A.J. Nozik, Eds., Imperial College Press, London, vol. III, Chapter 5, **2008**, pp. 275-392.
10. **N. Serpone**, Applied Heterogeneous Photocatalysis with Semiconductor Materials: Photo-catalyzed Detoxification of Wastewaters and Air. (**Invited Article**), in the ***Kirk-Othmer Encyclopedia of Chemical Technology***, Wiley-Interscience, New York, **1996**, vol. 18, pp. 820-837.
9. H. Hidaka, J. Zhao, K. Nohara, K. Kitamura, Y. Satoh, E. Pelizzetti, and **N. Serpone**, Photocatalyzed mineralization of non-ionic (C_nE_m) and heteroatom-containing (N, P) cationic and anionic surfactants at TiO₂/H₂O interfaces, in ***Photocatalytic Purification and Treatment of Water and Air***, D.F. Ollis and H. Al-Ekabi, Eds., Elsevier, Amsterdam, The Netherlands, 1993, pp. 251-260.
8. **N. Serpone**, R. Terzian, D. Lawless, and J.-M. Herrmann, Light-induced electron transfer in inorganic systems in homogeneous and heterogeneous phase. (**Invited chapter**), in ***Advances in Electron Transfer Chemistry***, P.S. Mariano, Ed., vol. III, JAI Press Inc., **1993**, pp. 33-166.
7. A.M. Braun, M.-T. Maurette, E. Oliveros, D.F. Ollis and **N. Serpone**, “Photochemical Reactors”, in ***Industrial Photochemistry***, M.L. Viriot, J.C. Andre, A.M. Braun, Eds., CPIC-ENSIC, **1990**, vol. A, pp. 253-301.
6. D.F. Ollis, E. Pelizzetti, and **N. Serpone**, in **N. Serpone** and E. Pelizzetti, Heterogeneous photocatalysis in the environment: Application to water purification, ***Photocatalysis - Fundamentals and Applications***, Wiley, New York, **1989**, pp. 604-637.
5. H. Al-Ekabi and **N. Serpone**, in **N. Serpone** and E. Pelizzetti, Mechanistic implications in surface photochemistry, ***Photocatalysis - Fundamentals and Applications***, Wiley, New York, **1989**, pp. 458-488.
4. **N. Serpone**, Photoinduced electron transfer in hexacoordinate inorganic complexes, in ***Photoinduced Electron Transfer***, M.A. Fox and M. Chanon, Eds., Elsevier, Amsterdam, The Netherlands, Part D, chapter 5.3, **1988**, pp. 47-147.
3. **N. Serpone** and M.A. Jamieson, Iridium, in ***Comprehensive Coordination Chemistry***, Sir G. Wilkinson, R. D. Gillard, and J.A. McCleverty, Eds., vol. 4, chapter 49, Pergamon Press Inc., London, **1988**, pp 1097-1177
2. **N. Serpone**, P. Pichat, and J.-M. Hermann, and E. Pelizzetti, Interparticle electron transfer in semiconductor dispersions. A new strategy in photocatalysis, in ***Supramolecular Photochemistry***, V. Balzani, Ed., NATO-ASI Series C, vol.214, D. Reidel Publ.Co., Dordrecht, The Netherlands, **1987**, pp 415-434.
1. E. Borgarello, **N. Serpone**, M. Graetzel, and E. Pelizzetti, Production of hydrogen through microheterogeneous photocatalysis of hydrogen sulfide: the thiosulfate cycle, in ***Hydrogen Energy Progress V***, T.N. Veziroglu and J.B. Taylor, Eds., Vol.III, Pergamon Press, New York, **1984**, pp 1039-1046.

(C) ARTICLES {C = communication or note; F = full paper; R = review} for 2010 to 2015

2015

- F450. S. Horikoshi, T. Nakamura, M. Kawaguchi, and **N. Serpone**, Enzymatic proteolysis of peptide bonds by a metallo-endoproteinase under precise temperature control with 5.8-GHz microwave radiation, *J. Mol. Catal. B*, 116 (2015) 52-59.
- F449. H. Hidaka, T. Tsukamoto, Y. Mitsutsuka, T. Oyama and **N. Serpone**, Enhanced Photo-mineralization of Hydrophobic Insecticide Fipronil by Gallium Oxide Catalysis in Aqueous Organic Media upon UVC Irradiation, *Photochem. Photobiol. Sci.*, **in press 2015**.
- F448. E.S. Artemyeva, D.S. Barinov, F.M. Atitar, A.A. Murashkina, A.V. Emeline and **N. Serpone**, Luminescence of Photoactivated Pristine and Cr-Doped MgAl₂O₄ Spinel, *Chem. Phys. Letters*, 626 (2015) 6-10.
- F447. S. Horikoshi, H. Tsutsumi, H. Matsuzaki, A. Furube, and **N. Serpone**, *In-situ* nanosecond transient absorption spectroscopy of TiO₂ systems under microwave irradiation and influence of oxygen vacancies on the UV-driven/microwave-assisted TiO₂ photocatalysis, *J. Mater. Sci. C.*, **submitted October 2014**.
- F446. S. Li, B. Al-Otaibi, W. Huang, Z. Mi, R. Nechache, **N. Serpone**, and F. Rosei, Epitaxial Bi₂FeCrO₆ Multiferroic Thin Film as a New Visible Light Absorbing Photocathode Material, *Energy Environ. Sci.*, **submitted October 2014**.

2014

- F445. V. N. Kuznetsov, A. V. Emeline, N. I. Glazkova, R. V. Mikhaylov, and **N. Serpone**, Real-time *in-situ* monitoring of optical absorption changes in visible-light-active TiO₂ under light irradiation and temperature-programmed annealing, *J. Phys. Chem. C*, 118 (2014) 27583 – 27593.
- R444. S. Horikoshi and **N. Serpone**, Coupled Microwave/Photoassisted Methods for Environmental Remediation, *Molecules*, 19 (2014) 18102-18128 SH-NS review
- R443. S. Protti, A. Albini, and **N. Serpone**, Photocatalytic Generation of Solar Fuels from the Reduction of H₂O and CO₂: A Look at the Patent Literature, *Phys. Chem. Chem. Phys.*, 16 (2014) 19790–19827 (**Perspective paper and Hot paper for 2014**).
- F442. H. Hidaka, T. Tsukamoto, Y. Mitsutsuka, T. Takamura, **N. Serpone**, Photochemical and Ga₂O₃-photoassisted decomposition of the insecticide Fipronil in aqueous media upon UVC radiation, *New J. Chem.*, 38, (2014) 3939–3952.
- F441. S. Horikoshi, M. Kamata, S. Sakamoto, T. Mitani, and **N. Serpone**, Control of microwave-generated hot spots. 6. Generation of hot spots in dispersed catalyst particulates and factors that affect catalyzed organic syntheses in heterogeneous media, *Ind. Engin. Chem. Res.*, **accepted September 3, 2014**.
- C440. N. I. Glazkova, A. V. Emeline, V. N. Kuznetsov, R. V. Mikhaylov, V. K. Ryabchuk, **N. Serpone**, Solar Absorption of Titania Thermochemically Fabricated from Titanium and its Alloys. UV and Visible Light Induced Photochromism of Yellow Titania, *Proc. 8th European Meeting on Solar Chemistry & Photocatalysis: Environmental Applications*, Thessaloniki, Greece, June 25-28, 2014.
- C439. N. I. Glazkova, V. N. Kuznetsov, R. V. Mikhaylov, **N. Serpone**, Novel Accessory for the Cary Eclipse Fluorescence Spectrophotometer for Kinetic Studies of the Photophysical Properties in Photochromic Materials, *Proc. 8th European Meeting on Solar Chemistry & Photocatalysis: Environmental Applications*, Thessaloniki, Greece, June 25-28, 2014.
- R438. S. Horikoshi and **N. Serpone**, Role of microwaves in heterogeneous catalytic systems, *Catal. Sci. Technol.*, 4 (2014) 1197-1210.
- F437. T. Oyama, T. Otsu, Y. Hidano, T. Koike, **N. Serpone**, and H. Hidaka, Remediation of aquatic environments contaminated with hydrophilic and lipophilic pharmaceuticals by TiO₂-photoassisted ozonation, *J. Environ. Chem. Eng.*, 2 (2014) 84–89.
- F436. S. Horikoshi, S. Matsuzaki, S. Sakamoto, and **N. Serpone**, Efficient degassing of dissolved oxygen in aqueous media by microwave irradiation and the effect of microwaves on a reaction catalyzed by Wilkinson's catalyst, *Radn. Phys. Chem.*, 97 (2014) 48–55.

- F435. S. Horikoshi and **N. Serpone**, On the influence of the microwaves' thermal and non-thermal effects in titania photoassisted reactions, *Catal. Today*, 224 (2014) 225-235.

2013

- F434. V.N. Kuznetsov, A.V. Emeline, A.V. Rudakova, M. S. Aleksandrov, N.I. Glazkova, L.A. Lovtcus, G.V. Kataeva, R.V. Mikhaylov, V.K. Ryabchuk, and **N. Serpone**, Colored Titania Thermochemically Fabricated from Titanium and its Alloys. UV and Visible Light Induced Photochromism of Yellow Titania, *J. Phys. Chem. C*, 117 (2013) 25852-25864.
- F433. S. Horikoshi, T. Sumi, and **N. Serpone**, A hybrid microreactor/microwave high-pressure flow system of a novel concept design and its application to the synthesis of silver nanoparticles, *Chem. Engin. Proc.: Proc. Intensif.*, 72 (2013) 59-66.
- F432. S. Horikoshi, A. Osawa, S. Sakamoto, and **N. Serpone**, Control of microwave-generated hot spots. Part IV. Control of hot spots on a heterogeneous microwave-absorber catalyst surface by a hybrid internal/external heating method, *Chem. Engin. Proc.: Proc. Intensif.*, 69 (2013) 52-56.
- F431. S. Horikoshi, S. Sakamoto and **N. Serpone**, Formation and efficacy of TiO₂/AC composites prepared under microwave irradiation in the photoinduced transformation of the 2-propanol VOC pollutant in air, *Appl. Catal. B: Environ.*, 140/141 (2013) 646-651.
- F430. S. Horikoshi, A. Osawa, S. Sakamoto, **N. Serpone**, Control of microwave-generated hot spots. Part V. Mechanisms of hot-spot generation and aggregation of catalyst in a microwave-assisted reaction in toluene catalyzed by Pd-loaded AC particulates, *Appl. Catal. A: General*, 460/461 (2013) 52-60.
- F429. S. Horikoshi, Y. Minatodani, H. Tsutsumi, H. Uchida, M. Abe, and **N. Serpone**, Influence of lattice distortion and oxygen vacancies on the UV-driven/ microwave-assisted TiO₂ photocatalysis, *J. Photochem. Photobiol. A:Chem.*, 265 (2013) 20-28.
- F428. Kuznetsov, V.N., Ryabchuk, V.K., Emeline, A.V., Mikhaylov, R.V., Rudakova, A.V., **Serpone, N.**, Thermo- and photo-stimulated effects on the optical properties of rutile titania ceramic layers formed on titanium substrates, *Chem. Mater.*, **2013**, 25 (2), 170-177
- F427. H. Hidaka, T. Tsukamoto, T. Oyama, Y. Mitsutsuka, T. Takamura and **N. Serpone**, Photo-assisted defluorination of fluorinated substrates and pharmaceuticals by a wide bandgap metal oxide in aqueous media, *Photochem. Photobiol. Sci.*, 12 (2013) 751-759.

2012

- F426. S. Horikoshi, T. Sumi, **N. Serpone**, Unusual effect of the magnetic field component of the microwave radiation on aqueous electrolyte solutions, *J. Microwave Power Electromagn. Energy*, **2012**, 46, 215-228.
- F425. Horikoshi, S., Matsuzaki, S., Mitani, T., **Serpone, N.**, Microwave frequency effects on dielectric properties of some common solvents and on microwave-assisted syntheses: 2-Allyl-phenol and the C₁₂-C₂-C₁₂ Gemini surfactant, *Rad. Phys. Chem.*, **2012**, 81(12), 1885-1895
- F424. Emeline, A.V., Kuznetsov, V.N., Ryabchuk, V.K., **Serpone, N.**, On the way to the creation of next generation photoactive materials, *Environ. Sci. Poll. Res.*, **2012**, 19(9), 3666-3675
- R423. **Serpone, N.**, Emeline, A.V., Horikoshi, S., Kuznetsov, V.N., Ryabchuk, V.K., On the genesis of heterogeneous photocatalysis: A brief historical perspective in the period 1910 to the mid-1980s , *Photochem. Photobiol. Sci.*, **2012**, 11(7), 1121-1150
- F422. Emeline, A.V., Abramkin, D.A., Zonov, I.S., Sheremetyeva, N.V., Rudakova, A.V., Ryabchuk, V.K., **Serpone, N.**, Photoinduced radical processes on the spinel (MgAl₂O₄) surface involving methane, ammonia, and methane/ammonia, *Langmuir*, **2012**, 28, 7368-7373.
- F421. Dondi, D., Merli, D., Albini, A., Zeffiro, A., **Serpone, N.**, Chemical reaction networks as a model to describe UVC- and radiolytically-induced reactions of simple compounds, *Photochem. Photobiol. Sci.*, **2012**, 11(5) 835-842.
- F420. Horikoshi, S., Suttisawat, Y., Osawa, A., Takayama, C., Chen, X., Yang, S., Sakai, H., **Serpone, N.**, Organic syntheses by microwave selective heating of novel metal/CMC catalysts. The Suzuki-

Miyaura coupling reaction in toluene and the dehydrogenation of tetralin in solvent-free media, *J. Catal.*, **2012**, 289, 266-271.

- F419. **Serpone, N.**, Emeline, A.V., Semiconductor photocatalysis - Past, present, and future outlook, *J. Phys. Chem. Letters*, **2012**, 3(5), 673-677. (*Invited Commentary*).

2011

- F418. Horikoshi, S., Osawa, A., Abe, M., **Serpone, N.**, On the generation of hot-spots by microwave electric and magnetic fields and their impact on a microwave-assisted heterogeneous reaction in the presence of metallic Pd nanoparticles on an activated carbon support, *J. Phys. Chem. C*, 2011, 115(46), 23030-23035
- F417. Horikoshi, S., Sato, S., Abe, M., **Serpone, N.**, A novel liquid plasma AOP device integrating microwaves and ultrasounds and its evaluation in defluorinating perfluorooctanoic acid in aqueous media, *Ultrason. Sonochem.*, 2011, 18(5), 938-942
- R416. Horikoshi, S., **Serpone, N.**, Microwave frequency effect(s) in organic chemistry, *Mini-Rev. Org. Chem.*, 2011, 8(3), pp. 299-305
- F415. Horikoshi, S., Muratani, M., Miyabe, K., Ohmura, K., Hirowatari, T., **Serpone, N.**, Abe, M., Influence of humidity and of the electric and magnetic microwave radiation fields on the remediation of TCE-contaminated natural sandy soils, *J. Oleo Sci.*, 2011, 60(7), 375-383
- F414. Horikoshi, S., Tsuchida, A., Sakai, H., Abe, M., **Serpone, N.**, Microwave discharge electrodeless lamps (MDELs). VI. Performance evaluation of a novel microwave discharge granulated electrodeless lamp (MDGEL) - Photoassisted defluorination of perfluoroalkoxy acids in aqueous media, *J. Photochem. Photobiol. A: Chem.*, 2011, 222(1), 97-104
- F413. Horikoshi, S., Sato, T., Sakamoto, K., Abe, M., **Serpone, N.**, Microwave discharge electrodeless lamps (MDEL): Part VII. Photo-isomerization of trans-urocanic acid in aqueous media driven by UV light from a novel Hg-free Dewar-like microwave discharge thermally-insulated electrodeless lamp (MDTIEL). Performance evaluation, *Photochem. Photobiol. Sci.*, 2011, 10(7), 1239-1248
- F412. Horikoshi, S., Abe, M., Sato, S., **Serpone, N.**, Effect of microwave radiation on the (Raman) lattice phonons in selected titanium dioxide solid specimens, *J. Photochem. Photobiol. A: Chem.*, 2011, 220(2-3), 94-101
- F411. Oyama, T., Otsu, T., Hidano, Y., Koike, T., **Serpone, N.**, Hidaka, H., Enhanced remediation of simulated wastewaters contaminated with 2-chlorophenol and other aquatic pollutants by TiO₂-photoassisted ozonation in a sunlight-driven pilot-plant scale photoreactor, *Solar Energy*, 2011, 85(5), 938-944
- F410. Horikoshi, S., Abe, H., Sumi, T., Torigoe, K., Sakai, H., **Serpone, N.**, Abe, M., Microwave frequency effect in the formation of Au nanocolloids in polar and non-polar solvents, *Nanoscale*, 2011, 3(4), 1697-1702
- F409. Méndez-Arriaga, F., Otsu, T., Oyama, T., Gimenez, J., Esplugas, S., Hidaka, H., **Serpone, N.**, Photooxidation of the antidepressant drug Fluoxetine (Prozac ®) in aqueous media by hybrid catalytic/ozonation processes, *Water Res.*, 2011, 45(9), pp. 2782-2794
- F408. Braslavsky, S.E., Braun, A.M., Cassano, A.E., Emeline, A.V., Litter, M.I., Palmisano, L., Parmon, V.N., **Serpone, N.**, Glossary of terms used in photocatalysis and radiation catalysis (IUPAC recommendations 2011), *Pure & Appl. Chem.*, 2011, 83(4), pp. 931-1014
- F407. Horikoshi, S., Minami, D., Ito, S., Sakai, H., Kitamoto, D., Abe, M., **Serpone, N.**, Molecular dynamics simulations of adsorption of hydrophobic 1,2,4-trichlorobenzene (TCB) on hydrophilic TiO₂ in surfactant emulsions and experimental process efficiencies of photo-degradation and photo-dechlorination, *J. Photochem. Photobiol. A: Chem.*, 2011, 217(1), pp. 141-146
- F406. Horikoshi, S., Minatodani, Y., Sakai, H., Abe, M., **Serpone, N.**, Characteristics of microwaves on second generation nitrogen-doped TiO₂ nanoparticles and their effect on photoassisted processes, *J. Photochem. Photobiol. A: Chem.*, 2011, 217(1), pp. 191-200.

2010

- F405. Horikoshi, S., Akao, Y., Ogura T., Sakai H., Abe M., **Serpone N.**, On the stability of surfactant-free water-in-oil emulsions and synthesis of hollow SiO₂ nanospheres, *Coll. Surf. A: Physicochem. Engin. Aspects*, 2010, 372(1-3), 55-60.
- F404. Oyama T., Takeuchi M., Yanagisawa I., Koike T., **Serpone, N.**, Hidaka, H., Sunlight Photo-Assisted TiO₂-Based Pilot Plant Scale Remediation of (Simulated) Contaminated Aquatic Sites , *J. Oleo Sci.*, 2010, 59(12), 673-680.
- F403. Horikoshi S., Osawa A., Suttisawat Y., Abe M., **Serpone N.**, A Novel Dewar-Like Reactor for Maintaining Constant Heat and Enhancing Product Yields during Microwave-Assisted Organic Syntheses, *Org. Proc. Res. Develop.*, 2010, 14(6), 1461-1464.
- C402. Ollis D., Pichat P., **Serpone N.**, TiO₂ photocatalysis-25 years Preface, *Appl. Catal. B: Environ.*, 2010, 99(3-4), 377-377.
- F401. Hidaka H., Oyama T., Horiuchi T., Koike T., **Serpone N.**, Photo-induced oxidative synergistic degradation of mixed anionic/cationic surfactant systems in aqueous dispersions. A detailed study of the DBS/HTAB system, *Appl. Catal. B: Environ.*, 2010, 99(3-4), 485-489.
- F400. Horikoshi S., Matsubara A., Takayama S., Sato M., Sakai F., Kajitani M., Abe M., **Serpone N.**, Characterization of microwave effects on metal-oxide materials: Zinc oxide and titanium dioxide, *Appl. Catal. B: Environ.*, 2010, 99(3-4), 490-495.
- F399. **Serpone N.**; Horikoshi S.; Emeline A.V., Microwaves in advanced oxidation processes for environmental applications. A brief review, *J. Photochem. Photobiol. C: Photochem. Rev.*, 2010, 11(2-3), 114-131.
- C398. Emeline A., Kuznetsov V.N., Ryabchuk V.K., **Serpone, N.**, Absorption spectra of visible-light-active TiO₂ specimens in the visible spectral domain, Abstracts of Papers of the American Chemical Society, 2010, 240 pp. 147-ENVR
- C397. **Serpone N.**, Pichat P., Ollis D.F., TiO₂-14 Special Issue from Conference in Niagara Falls, N.Y., Fall 2009 Preface, *J. Adv. Oxid. Technol.*, 2010, 13(3), 230-231.
- F396. Hidaka H., Tamano T., Fujimoto T., Machinami T., Oyama T., Horiuchi T., **Serpone N.**, Binary Cationic BDDAC/Anionic DoS Surfactant Systems of Variable Compositions. Mineralization by an Advanced Oxidation Process in Aqueous Dispersions, *J. Adv. Oxid. Technol.*, 2010, 13(3), 274-280.
- F395. Horikoshi S., Fukui M., Tsuchiya K., Abe M., **Serpone N.**, Microwave specific effects in organic synthesis: A proposed model from the solvent-free synthesis of monoglycerylcetyldimethylammonium chloride, *Chem. Phys. Letters*, 2010, 491(4-6), 244-247.
- F394. Ito S., Worakitkanchanakul W., Horikoshi S., Sakai H., Kitamoto D., Imura T., Chavadej S., Rujiravanit R., Abe M., **Serpone N.**, Photooxidative mineralization of microorganisms-produced glycolipid biosurfactants by a titania-mediated advanced oxidation process, *J. Photochem. Photobiol. A: Chem.*, 2010, 209(2-3), 147-152.
- F393. Horikoshi S., Abe H., Torigoe K., Abe M., **Serpone N.**, Access to small size distributions of nanoparticles by microwave-assisted synthesis. Formation of Ag nanoparticles in aqueous carboxy-methylcellulose solutions in batch and continuous-flow reactors, *Nanoscale*, 2010, 2(8), 1441-1447.