

CURRICULUM VITAE

NAME

D'Ulivo, Alessandro

Birth date: 27th August 1954

Birth place: Pescia, Italy



AFFILIATION AND POSITION

Senior Researcher

Institute of Chemistry of Organometallic Compounds

National Research Council of Italy

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LANGUAGES

Italian and English.

DEGREES

1972-1978 Doctor in Chemistry, University of Pisa, Italy

EXPERIENCE

2010-now Senior Researcher, National Research Council of Italy, Institute of Chemistry of Organometallic Compounds (ICCOM-CNR), Pisa;

2010- 2013 Head, ICCOM-CNR, U.O.S of Pisa.

2006 –2010 Senior Researcher, National Research Council of Italy, IPCF-CNR;

2002-2009 National Research Council of Italy, Istituto per i processi chimico-fisici (IPCF-CNR)

1981-2001 National Research Council of Italy, Institute of Instrumental Analytical

Chemistry, Pisa (CNR-ICAS),

- Researcher, permanent position, **(1985-2006)**;
- Researcher **(1981-1985)**: “Development of spectrometric and polarographic analytical methods for metals at ultratrace level in natural water”, “Determination of trace elements in natural waters of S. Rossore Park”,

1977-1978 University of Pisa, Institute of Organic Chemistry, Doctorate thesis: “Conformational studies by vibrational spectroscopy (IR and Raman) and normal co-ordinate calculations on model compounds of chiral poly- α -olefins”.

1. SCIENTIFIC ACTIVITIES (*)

Alessandro D'Ulivo gains a consolidated international reputation for his research in the field of Analytical Atomic Spectroscopy, and for his original research on fundamental aspects of chemical vapor generation giving a decisive contribution in the elucidation of the mechanisms involved in vapor generation techniques, which has been published on prestigious scientific journals in the relevant field such as *Analytical Chemistry (ACS)*, *Spectrochimica Acta Part B*, *Atomic Spectroscopy*

(Elsevier), *Journal of Analytical Atomic Spectrometry* (RSC), *Analyst* (RSC), *Analytica Chimica Acta* (Elsevier), *Journal of the American Society of Mass Spectrometry* (JASMS), *Talanta* (Elsevier), *Analytical and Bioanalytical Chemistry* (Springer).

The main research interests of Alessandro D'Ulivo are related to fundamentals and applications of analytical methods and instrumentation devoted to trace and ultratrace chemical analysis by atomic spectrometry and mass spectrometry, the development of element specific detectors for chromatography (both GC and HPLC / IC) and hyphenated techniques, in particular the use of vapor generation techniques (chemical and photochemical vapor generation).

In synthesis they can be described as follow.

- *Innovative instrumental devices for atomic fluorescence spectrometry (AFS), based on non dispersive optics, which are developed with the aim to realize simple and sensitive, interference free element specific detectors to be coupled with both vapor generation techniques [2-5, 7-10, 21, 27] and chromatographic techniques [6, 11, 37, 48, 50, 51, 53, 56, 73]. In consideration of the evidence that AFS gives the analytical performances in combination with the introduction of gaseous samples, many research activities have been devoted to the development and optimization of derivatizing methods which are able to convert the analytical species of interest to volatile derivatives. Among them, the generation volatile hydrides (HG) (AsH₃, SbH₃, BiH₃, GeH₄, SnH₄, PbH₄, H₂Se, etc) or volatile species of metals (Hg⁰, Cd⁰ and many others transition and noble metal species, not yet identified) by aqueous phase reaction with boranes [44, 45, 54] or photochemical vapor generation using innovative, integrated microwave-UV reactors [79, 86]. Fundamental studies in the field of HG comprise the development of novel "hydride" atomizers [12, 26, 75], including the study and elucidation of the mechanisms of atomization and atomization interferences [23, 30, 41, 42, 57, 59], the study of liquid phase interferences taking place in the hydride generation step [15,17], the optimization of pre-treatment and digestion step [20, 18, 28] and the use of borane reagents, alternative to NaBH₄ for aqueous phase HG [45].*
- *In the field of chemical vapor generation, a highly significant contribution is represented by the studies which bring to the identification of the mechanism controlling the formation of volatile hydrides by using aqueous boranes [46, 47, 49, 55, 61, 69, 82, 89, 91] and the mechanism of action of chemical additives [29, 34, 38, 43, 67, 68, 76] which were unknown in spite of the widespread use in consolidated analytical protocols for more the 35 years. In this context it was of paramount importance the development of mass spectra deconvolution techniques which allowed the quantification of different isotopologues that are formed in deuterium labeled experiments [58, 65, 94] and laser induced breakdown spectrometric method for the determination of H/D ratio [60]. Following the results of some of the published studies, on January 2008 IUPAC granted a project (Project #2007-041-1-500, A. D'Ulivo, Chairman) with the aim to clarify unknown and controversial aspect of HG techniques for trace element determination, and the project has been successfully completed on March 2011 [87, 93].*
- *Novel derivatization techniques have been implemented by aqueous phase alkylation with sodium tetraethyl borates and trialkyloxonium salts. The use of trialkyloxonium salts (R₃O⁺X; R= Et, Me; X=BF₄, FeCl₄) allows the conversion of several inorganic ions such as, halogen ions (F, Cl, Br, I), cyanate, thiocyanate, sulfide, nitrite and nitrate to volatile alkyl derivatives RX (X=F, Cl, Br, I), RCN, RSCN, R₂S, RONO and RONO₂. This new derivatization technique allows anions to be sensitively determined at ultratrace level using gas chromatography mass spectrometry. The accuracy of the determination could be dramatically improved by the use of isotope dilution technique whenever suitable isotopic labeled standard are available [78, 88, 92, 95].*
- *In the field of atomic absorption spectrometry, the development of new permanent matrix modifiers for graphite furnace atomizer based on the use of W-Ir, W-Pd, Zr-Ir and Zr-Pd has bring to significant improvements in the determination of volatile elements at ultratrace level (As, Se, Sb, Bi, Te, Sn, Pb, Cd, Hg) both by direct sample introduction and by in-situ trapping of their volatile derivatives, which can be achieved on-line by chemical vapor generation techniques [22, 24, 25, 33, 39].*

- *The derivatization of thiolic compounds and thiolic proteins, or their selenium analogues, with mercurial probes (Hg^{2+} , $NaOOCPhHgOH$) forming stable complexes, was developed for several innovative application based on atomic or mass spectrometric techniques, which are employed following mercury labeling of targeted compounds [31, 80, 84, 85], allowing the determination of thiols and thiolic compounds [63, 70, 73, 77, 80, 81], the speciation of mercury [53, 90] the characterization and determination of thiolic groups in proteins [32, 37, 64].*

The scientific activities above described were carried in the mainframe of numerous projects supervised by Alessandro D'Ulivo:

- institutional projects supported by CNR (see sections 3 and 4);
- cooperation programs and projects supported by prestigious institutions as Max Planck Institute for Chemistry (Mainz), Academy of Science of the Czech Republic (Prague), Laurentian University (Sudbury, ON, Canada), National Research Council of Canada, IUPAC, MURST, EU and Commission of European Communities (see section 5).

Part of the scientific activities was carried out by Alessandro D'Ulivo during visiting fellowship stays, and invited scientist fellowships granted by the host institutions (see section 6).

The experience and know-how he developed in the mainframe of his research activities attracted several projects (see section 5) and supported also intensive consulting activities based on technology transfer to several medium and small enterprises through research contracts, supervised by Alessandro D'Ulivo, concerning with trace element determination and speciation and the implementation of on-line analyzer for monitoring the emission of coal power plants (see section 5).

He was invited to be an IUPAC fellow and member of Editorial Boards of prestigious scientific journals and is involved in intensive editorial activities as reviewer in many prestigious scientific journals in the field of analytical chemistry and spectrochemistry (see section 8), in the evaluation of research projects for national and foreign institution, he has been invited to organize scientific sessions and to held several invited and keynote lectures at international congresses (see sections 8 and 9C).

He has been awarded of the national scientific qualification of Full Professor in Analytical Chemistry, and he is involved in teaching and supervision activities at Pisa University and Scuola Normale Superiore, National School of Analytical Chemistry for PhD students, and training courses funded by Tuscany Region Recently. He is Chairman of Colloquium Spectroscopicum Internationale XL, to be held and organized in Pisa on 2017. (see section 7)

(*) For references see section 9B. Complete list of publications.

2. MANAGEMENT EXPERIENCE

From July 2010 to October 2013, Alessandro D'Ulivo is Head of the Institute of Chemistry of Organometallic Compounds, U.O.S. of Pisa (UOS-ICCOM), and he coordinates and supervises the working and research activities of a permanent staff, which includes 20 researchers, 5 technicians and 2 administrative units, 7 associate researchers, plus PhD students, post-docs and visting workers (15 units in total). The research activity of UOS-ICCOM is carried out in five laboratories (Analytical Instrumental Chemistry, Applied Laser Spectroscopy, Magnetic Resonance Spectroscopy, Polymeric Material Chemistry, Theoretical and Computational Chemistry) and they attracted, in the last years, grants from public and private institutions, which includes: the coordination of the European Project Life (2012-2013) ECOFATTING (LIFE10 ENV/IT/000364) and the European Project Life+ (2013-2014) SOREME (LIFE11-ENV/IT/109); two operative units in FP7, PEOPLE, 2012-2013 (Marie Curie Actions) and DIBBIOPACK; Projects funded by MIUR (five operative units in PRIN 2008, one operative unit in PRIN2009, two operative units in PRIN 2010-2011, one operative units in FIRB2010, one operative units in FIRB2011), two projects funded by Tuscany Region (MONDI, VAT), one operative unit of POLOPTEL Project (CARIPI, Fondazione Cassa di Risparmio Pisa), ENEL (3 Contracts), Marwan Technologies (2 Contracts), BASF (2 contracts) for a total budget of more than 4500 k€

He is leader of the research group “Analytical Instrumental Chemistry Lab” (AIC-Lab) at the UOS-ICCOM, composed by 1 Senior Researchers, 3 Researchers, 2 Technicians, 1 Associate Researcher, 1 PhD student, 2 graduate students, which is one of the leading groups in the field of trace analysis. He has supervised more than 16 graduate and PhD students. The instrumentation and part of the staff of AIC-Lab is supporting the service “Analytical Atomic Spectroscopy” for trace element determination and speciation. The AIC-Lab has an intensive activities in the coordination of three European Projects Life, [ECOFATTING (LIFE10 ENV/IT/000364), 2012-2013; SOREME (LIFE11-ENV/IT/109), 2013-2014; BIONAD(LIFE12-ENV/IT/352)] and three research contracts (ENEL) for a total budget of more than 3200 k€

Since 1993 he is principal investigator and in charge of the managing activities of institutional projects of CNR (See sections 3 and 4), and in projects funded by EU, joint projects between CNR and the Academy of Science of Czech Republic, joint project for scientific cooperation between Italy and Canada (Ministry of Foreign Affairs), MURST, IUPAC and research contracts funded by private and public institutions (see section 5) for a total budget of more than 400 k€

He participated to the organization of international and national conferences (see section 8)

3. PROJECT LEADER IN CNR-ICAS RESEARCH PROJECTS (1987-2002)

- “Developments of speciation methods for organometalloids using atomic fluorescence detection”;
- “Developments of analytical methods for ultratrace determination of elements forming volatile derivatives”;
- “Analytical methods and instrumentation in vapor generation atomic fluorescence spectrometry”

4. PROJECT LEADER IN CNR-IPCF RESEARCH PROJECTS

2010-2011-2012 “Instrumental Analytical Chemistry” (PM.P03.015.002)

2008 – “Laboratory of Instrumental Analytical Chemistry”; (MD.P01.019)

“Methodologies for characterization of surface activity/reactivity” (PM.P05.003.002)

5. PROJECTS AND RESEARCH CONTRACTS

5A. Principal Investigator and Project Leader

2015 Research Contract between CNR-ICCOM and ENEL Green Power S.p.A. “Implementation of chemical trapping system for determination of mercury in geothermal vapor”.

2014 Research Contract between CNR-ICCOM and ENEL Ingegneria e Ricerca S.p.A. “Implementation of a prototype device for the continuous monitoring of Se and As in the gas phase and testing of full-scale operation”.

2014-2016 Coordinator, Project of EU, Life+ BIONAD (LIFE12ENV/IT/352) “Naturalised dyes replacing commercial colorants for environmentally friendly leather dyeing and water recycle”.

2012 Research Contract between CNR-ICCOM and ENEL Servizi s.r.l “Mechanism of formation of metal complexes in geothermal power plants”.

2012 Research Contract between CNR-ICCOM and ENEL Servizi s.r.l “Development of on-line analyzer for the determination of arsenic and selenium in the emission of coal power plant”.

2011 Research Contract between CNR-ICCOM and ENEL Ingegneria & Innovazione-Ricerca: “Determination and speciation of arsenic in a geothermal power plant”.

2009 Research Contract between CNR-IPCF and ENEL Ingegneria & Innovazione-Ricerca: “Sampling and determination of trace elements in geothermal and coal power plants”

2009 Research Contract between CNR-IPCF/CNR-ISE and Cuoio Depur S.p.A. : “Determination of lead in soils and fertilizers”.

2008-2009 Chairman, IUPAC project: “Mechanistic aspects of chemical vapour generation of volatile hydrides for trace element determination” (Project #2007-041-1-500) <http://iupac.org/web/ins/2007-041-1-500>.

2007 Research contract between IPCF-CNR and ENELP S.p.A.: “Monitoring and speciation of volatile elements in geothermal power plant”.

2005 Research contract between IPCF-CNR and ENELP S.p.A. : “Monitoring and speciation of volatile elements in combustion fumes of coal power plant”;

2003 Research contract between IPCF-CNR and ENELP S.p.A. : “Monitoring and speciation of volatile elements in combustion fumes of coal power plant”;

2003 Research contract between IPCF-CNR and Sistemi Digitali S.r.l. “Multielement atomic fluorescence spectrometer for trace element determination”;

2001 Research contract between ICAS-CNR and ENELP S.p.A. : “Monitoring and speciation of volatile elements (Hg, Se) in combustion fumes of coal power plant”;

2001-2003 Joint Research Project between C.N.R. and Academy of Sciences of Czech Republic. Project Leader for C.N.R “Optimization of the flame-in-gas-shield atomizer for atomic fluorescence spectrometry ” ;

2000-2004 Joint Research Project between ICAS-CNR and Department of Chemistry and Biochemistry, Laurentian University (Sudbury , Ontario, Canada), Italian Ministry for Foreign Affairs, Cooperation in Culture, Science and Technology between Italy and Canada (Annex III, Art. 4.6, project N.17) Project Leader for Italian part “Determination and speciation of trace elements in natural aquatic systems”;

1998-2000 Sub contract between ICAS-CNR and University of Xanthi (Greece) in the mainframe of EU project BIGBLACK (Biogenic Gas Emission in the Black Sea, Contract N. IC15-CT96-0107);

1998-2000 Joint Research Project between C.N.R. and Academy of Sciences of Czech Republic. Project Leader for C.N.R “Optimization of hydride atomization for atomic spectrometry” ;

1995-1997 Joint Research Project between C.N.R. and Academy of Sciences of Czech Republic. Project Leader for C.N.R “Optimization of hydride atomization for atomic spectrometry” ;

1994-1997 “Determination of toxic metals in the sediments of Venice Lagoon”, Project “Venice Lagoon System”, MURST-University of Venice.

1993-1994 Commission of European Communities, P.E.C.O. Program "Optimization of hydride atomization for atomic spectrometry “ (Contract No ERB-CIPA-CT-92-0346).

5B. Participation to EU Projects

2015-2017 Project of EU, Life LIFETAN (LIFE14 ENV/IT/000443) “Eco friendly tanning cycle”

2014-2016 Project of EU, Life ECODEFATTING (LIFE13 ENV/IT/000470) “Environmentally friendly natural products instead of chemical products in the degreasing phase of the tanning cycle

2014-2015 Project of EU, Life AFTERCu (LIFE12 ENV/IT/000336) “Anti-infective environmental friendly molecules against plant pathogenic bacteria to reduce copper use in agriculture”

2013-2014 Project of EU, Life SOREME (LIFE11-ENV/IT/000109), “Low cost sorbents for mercury emissions”. Supervising experimental activities and management of the operative unit coordinating the project.

2012-2013 Project of EU, Life ECOFATTING (LIFE10 ENV/IT/000364), “Environmentally friendly natural products instead of chloroparaffins in the fatting pahse of the tanning cycle” Supervising experimental activities and management of the operative unit coordinating the project.

6. VISTING SCIENTIST

2015-2016 National Research Council of Canada, Measurement Science and Standards, Chemical Metrology (Ottawa), 1 month total (Dr. Zoltan Mester).

2004-2009 National Research Council of Canada, Institute for National Measurement Standards, Ottawa, (invited scientist 9 months, total, and short term mobility program of CNR, 2.5 months) “Fundamental studies of the reduction of metal ions in aqueous solution using tetrahydroborate”, (Coop. with Dr. Ralph Sturgeon and Dr. Zoltan Mester).

2001-2003 Academy of Sciences of Czech Republic (3 months, total), Joint Research Project between C.N.R. and Academy of Sciences of Czech Republic. “Optimization of hydride atomizers for atomic spectrometry” (Coop. with Dr. Jiri Dědina);

2001 Laurentian University, Dept. Chemistry and Biochemistry (15 days), Cooperation between Italy and Canada in Culture, Science and Technology, “Determination of elemental selenium in lake and river sediments by selective extraction and atomic spectrometry” (Coop. with Prof. Nelson Belzile and Dr. Yuwei Chen);

1998-2000 Academy of Sciences of Czech Republic (3 months, total), Joint Research Project between C.N.R. and Academy of Sciences of Czech Republic. “Atomization mechanism, fate of free atoms and temperature distribution in hydride atomizer studied by atomic absorption spectrometry” (Coop. with Dr. Jiri Dědina);

1995 Invited Scientist, Max Planck Institute for Chemistry, Mainz, Germany Biogeochemistry department (3 months), “Studies on atomic fluorescence detectors for mercury determination at the femtogram level” (Coop. with Dr. Spyridon Rapsomanikis);

1995-1997 Academy of Sciences of Czech Republic (3.5 months, total). Joint Research Project between C.N.R. and Academy of Sciences of Czech Republic. “Development of new hydride atomizers for analytical atomic spectrometry” (Coop. with Dr. Jiri Dědina);

1993 Academy of Sciences of Czech Republic, Prague (3 months), “Atomization and interference mechanisms in hydride atomizers studied by atomic absorption and atomic fluorescence spectrometry” (Coop. with Dr. J. Dědina), granted by Commission of European Communities, P.E.C.O. Program, with a specific contract (ERB-CIPA-CT-92-1503, 19-March-1993);

7. TEACHING

2013-2016 University of Pisa, Department of Chemistry and Industrial Chemistry: Associate Professor “Analytical Chemistry V”.

2013 - Awarded of the national scientific qualification of Full Professor in Analytical Chemistry (03/A1).

2011-2012 Scuola Normale Superiore, Pisa: “Complements of analytical chemistry and instrumental analysis”, Associate Professor.

2010-2011 Scuola Normale Superiore, Pisa: “Complements of analytical chemistry and instrumental analysis”, Invited lecturer for a cycle of seminar.

2004 National School of Analytical Chemistry for PhD students: “New methods in atomic spectrometry coupled with chemical vapor generation”, Bertinoro (FO).

2000 Training course “Advanced analytical methods in atomic spectrometry” for Ambiente S.c.r.l. (MS) funded Tuscany Region.

1992-2009 University of Pisa, Department of Chemistry and Industrial Chemistry: Associate Professor “Analytical application of hydride generation-atomic spectrometric techniques in trace elements analysis”;

1992-now Supervision of Theses , PhD 1 student, Graduate in Chemistry 18 students;

8. OTHER ACTIVITIES

8A Membership

2011-Now IUPAC Fellow, invitation by Prof. Nicole J. Moreau, IUPAC President;

2010 –now Member of Italian Chemical Society;

8B Editorial & Reviewing

2013 - Evaluation of a scientific projects submitted for granting ; MIUR (FIRB “Futuro in Ricerca 2013), and Grant Agencies of Czech Science Foundation;

2012 – now Member of the Editorial Board, The Scientific World Journal (Hindawi) for the Analytical Chemistry domain;

2011 – Member of Scientific Committee of the event “International Year of Chemistry”, Scuola Normale Superiore, Pisa, 11 February 2011;

2012 – now Member of Editorial Board, The Scientific World Journal (Hindawi) for the Analytical Chemistry domain;

2006 – now Member of the Editorial Advisory Board, Spectrochimica Acta Part B, Atomic Spectroscopy (Elsevier);

2004 – 2009 Evaluation of scientific project submitted for granting to Grant Agencies of Czech Science Foundation (six projects) and Academy of Sciences of the Czech Republic (2 projects);

1992 – now Reviewing: Scientific Journals – Analytical Chemistry(ACS), Analytical & Bioanalytical Chemistry(Springer), Spectrochimica Acta Part B(Elsevier), Journal of Analytical Atomic Spectrometry (RSC), Analyst (RSC), Analytica Chimica Acta (Elsevier), Talanta (Elsevier), Int. J.Environmental Analytical Chemistry (Taylor&Francis); Theses.

8C Conference Organization

2015 - Member of international scientific committee, Colloquium Spectroscopicum Internationale XXXIX, Figuera da Foz (Portugal) 29 august-2 september 2015.

2011 – Member of International Scientific Committee, Colloquium Spectroscopicum Internationale XXXVII, Buzios (Brazil) 28 August-2 September 2011.

2009 – Chairman and organizer of a scientific session, endorsed by IUPAC, “Mechanistic and fundamental aspects in the generation of volatile species for trace element determination” at XXXVI Colloquium Spectroscopicum Internationale (30 August-3 September 2009), Budapest.

1991 – Member of Organizing Committee “Colloquium Chemiometricum Mediterraneum”, October 21-24, 1991, San Miniato, Pisa.

9. PUBLICATIONS

Author and co-author of:

106 Publications on referred I.S.I. Journals (H-index = 29, Google Scholar), with over 2500 total citations.

1 book chapter, **1** Patent

19 Invited and Keynote lectures at International Congresses.

9A. Selected authored publications

A. D'Ulivo, "Mechanisms of chemical vapor generation by aqueous tetrahydridoborate. Recent developments toward the definition of a more general reaction model", *Spectrochimica Acta Part B*, 2016, **119**, 91-107.

A. D'Ulivo, "Mechanism of generation of volatile species by aqueous boranes. Towards the clarification of most controversial aspects", *Spectrochimica Acta Part B*, 2010, **65**, 360-375.

A. D'Ulivo, "Chemical vapor generation by tetrahydroborate(III) and borane-complexes in aqueous media. A critical discussion of fundamental processes and mechanisms involved in reagent decomposition and hydride formation", *Spectrochimica Acta, Part B*, 2004, **59**, 793-825

A. D'Ulivo, "Determination of selenium and tellurium in environmental samples" *Analyst*, 1997, **122**, 117R-144R.

A. D'Ulivo, "Atomic fluorescence detectors", in "*Environmental Analysis using Chromatography interfaced with Atomic Spectroscopy*", by R.M. Harrison and S. Rapsomanikis editors, Ellis Horwood Publisher, 1989, London, pp. 126-164 (ISBN 470214074).

A. D'Ulivo, "Studies on the determination of selenium by hydride generation non-dispersive atomic fluorescence spectrometry using hydrobromic acid-based reaction matrices". *Journal of Analytical Atomic Spectrometry*, 1989, **4**, 67-70.

A. D'Ulivo, "On the determination of total dissolved tin in natural waters by direct hydride generation and non-dispersive atomic fluorescence spectrometry" *Talanta*, 1988, **35**, 499-501.

9B. Complete List of Publications

111 B. Campanella, A. Menciasci, M. Onor, C. Ferrari, E. Bramanti, A. D'Ulivo, "Studies on photochemical vapor generation of selenium with germicidal low power ultraviolet mercury-based lamps" *Spectrochimica Acta Part B*. 2016, 126, 11-16 [10.1016/j.sab.2016.10.007]

110 **A. D'Ulivo**, "Mechanisms of chemical vapor generation by aqueous tetrahydridoborate. Recent developments toward the definition of a more general reaction model", *Spectrochimica Acta Part B*, 2016, **119**, 91-107. [10.1016/j.sab.2016.03.003]

109 B. Campanella, M. Onor, **A. D'Ulivo**, R. Giannecchini, M. D'Orazio, R. Petrini, E. Bramanti, "Human exposure to thallium through tap water: A study from Valdicastello Carducci and Pietrasanta (northern Tuscany, Italy)", *Science of the Total Environment*, 2016, **548-549**, 33-42.

- 108 B. Campanella, M. Onor, L. Biancalana, **A. D'Ulivo**, E. Bramanti, "Ovoalbumin labelling with p-hydroxymercurybenzoate: the effect of different denaturing agents and the kinetics of reaction", *Analytical Biochemistry*, 2015, **483**, 27-33.
- 107 S. Ammazzini, M. Onor, E. Pagliano, Z. Mester, B. Campanella, E. Pitzalis, E. Bramanti, and **A. D'Ulivo**, "Determination of thiocyanate in saliva by headspace gas chromatography-mass spectrometry, following a single-step aqueous derivatization with triethyloxonium tetrafluoroborate" *Journal of Chromatography A*, 2015, **1400**, 124-130.
- 106 **A. D'Ulivo**, Comment on "Understanding the effects of potassium ferricyanide on lead hydride formation in tetrahydroborate system and its application of lead in milk using hydride generation inductively coupled plasma optical emission spectrometry" by B. Deng, X. Xu, Y. Xiao, P. Zhu, Y. Wang", *Analytica Chimica Acta*, 2015, **884**, 26-27.
- 105 D. Pellegrini, M. Corsi, M. Bonanni, R. Bianchini, **A. D'Ulivo**, E. Bramanti, "Study of the interaction between collagen and naturalized and commercial dyes by Fourier Transform Infrared Spectroscopy and Thermogravimetric Analysis", *Dyes and Pigments*, 2015, **116**, 65-73.
- 104 D. P. C. de Quadros, B. Campanella, M. Onor, E. Bramanti; D. L. G. Borges, **A. D'Ulivo**, "Mercury speciation by high-performance liquid chromatography atomic fluorescence spectrometry using an integrated microwave/UV interface. Optimization of a single step procedure for the simultaneous photo-oxidation of mercury species and photo-generation of Hg⁰", *Spectrochimica Acta, Part B*, 2014, **101**, 312-319.
- 103 E. Pagliano, M. Onor, M. McCooeye, **A. D'Ulivo**, R.E. Sturgeon, Z. Mester, "Application of direct analysis in real time to a multiphase chemical system: 1 identification of 2 polymeric arsanes generated by reduction of monomethylarsenate with sodium tetrahydroborate", *Int. J. Mass Spectrom.*, 2014, **371**, 42-46.
- 102 M. Tofanelli, L. Pardini, M. Borrini, F. Bartoli, A. Bacci, **A. D'Ulivo**, E. Pitzalis, M.C. Mascherpa, S. Legnaioli, G. Lorenzetti, S. Pagnotta, G. de Holanda Cavalcanti, M. Lezzerini, V. Palleschi, "Spectroscopic analysis of bones for forensic studies", *Spectrochimica Acta, Part B*, 2014, **99**, 70-75.
- 101 B. Campanella, M. Onor, C. Ferrari, **A. D'Ulivo**, E. Bramanti, "Direct, simple derivatization of disulfide bonds in proteins with organic mercury in alkaline medium without any chemical pre-reducing agents", *Analytica Chimica Acta*, 2014, **843**, 1-6.
- 100 B. Campanella, M. Onor, **A. D'Ulivo**, S. Giannarelli, E. Bramanti, "The Impact of Protein Concentration on the Determination of Thiolic Groups of Ovalbumin. A SEC-CVG-AFS study via mercury labeling", *Analytical Chemistry*, 2014, **86**, 2251-2256
- 99 E. Pitzalis, M. Onor, M.C. Mascherpa, G. Pacchi, Z. Mester, **A. D'Ulivo**, "Chemical Generation of Arsane and Methylarsanes with Amine Boranes. Potentialities for Nonchromatographic Speciation of Arsenic", *Analytical Chemistry*, 2014, **86**, 1599-1607.

- 98 B. Campanella, J.G. Rivera, C. Ferrari, S. Biagi, M. Onor, **A. D'Ulivo**, E. Bramanti, "Microwave photochemical reactor for the online oxidative decomposition of p-hydroxymercurybenzoate (PHMB)- tagged proteins and their determination by cold vapor generation-atomic fluorescence detection", *Analytical Chemistry*, 2013, **85**, 12152-12157.
- 97 B. Campanella, M. Onor, M. C. Mascherpa, **A. D'Ulivo**, C. Ferrari, E. Bramanti; "Determination of thiomersal by flow injection coupled with microwave-assisted photochemical online oxidative decomposition of organic mercury and cold vapor atomic fluorescence spectroscopy", *Analytica Chimica Acta*, 2013, **804**, 66-69.
- 96 S. Monti, E. Bramanti, V. Della Porta, M. Onor, **A. D'Ulivo**, V. Barone, "Interaction of collagen with chlorosulphonated paraffin tanning agents: Fourier transform infrared spectroscopic analysis and molecular dynamics simulations", *Physical Chemistry Chemical Physics*, 2013, **15**, 14736-14747.
- 95 E. Pagliano, J. Meija, J. Ding, R. E. Sturgeon, **A. D'Ulivo**, Zoltán Mester, "Novel ethyl-derivatization approach for the determination of fluoride by headspace GC/MS", *Analytical Chemistry*, 2013, **85**, 877-881.
- 94 E. Pagliano, **A. D'Ulivo**, Z. Mester, R. E. Sturgeon, J. Meija, "The binomial distribution of hydrogen and deuterium in arsanes, diarsanes, and triarsanes generated from $\text{As(III)/[BH}_n\text{D}_{4-n}]^-$ and the effect of trace amounts of Rh(III) ions", *Journal of the American Society for Mass Spectrometry*, 2012, **23**, 2178-2186.
- 93 **A. D'Ulivo**, "Mechanisms of chemical generation of volatile hydrides for trace element determination (IUPAC Technical Report) [©2011 IUPAC]", *Spectrochimica Acta Part B*, 2012, **69**, 67-68.
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9D Patents

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