Europass Curriculum Vitae

Personal information

First name(s) / Surname(s)	**Giulia de Petris**
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E-mail	giulia.depetris@uniroma1.it
Nationality	Italian
Date of birth	
Gender	Female

Occupational field

Inorganic chemistry, Research and Teaching

Work experience

2000 -	Full Professor at Sapienza University of Rome, Faculty of Pharmacy and Medicine.
1995 - 2000	Associate Professor at the University of Rome “La Sapienza”, Faculty of Pharmacy.
1992 - 1995	Associate Professor at the Tuscia University of Viterbo, Faculty of Science
1985 - 1992	Researcher at the University of Rome “La Sapienza”, Faculty of Pharmacy.
1998 -	Director of the Mass Spectrometry Lab. ZAB

Education and training

1987	PhD in Pharmaceutical Science at the University of Rome “La Sapienza”, Faculty of Pharmacy.
1983	PhD Fellowship at the University of Rome “La Sapienza”, Faculty of Pharmacy.
1983	Degree in Pharmacy (110/110 cum laude).
1981-1983	Research activity at the Inorganic Chemistry Laboratories, University of Rome “La Sapienza”, Faculty of Pharmacy.
1981	Degree in Chemistry and Pharmaceutical Technology (110/110 cum laude).
1976	High school degree.

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Personal skills and competences

The research interests and the experimental activity have been focussing on the study of gas-phase chemistry by means of several mass spectrometric techniques. Early studies concerned charged species; they were aimed at evaluating the kinetic and thermochemical aspects of ion-molecule reactions. The most significant results in this area have been the detection and characterization of different protomers of nitrous and nitric acid, the evaluation of their PA's and the construction of extended scales of NO+ and NO2+ BE to a large number of nucleophiles of interest to the atmospheric chemistry. These themes have been further extended to the study of the reactivity of ozone in ionized mixtures, and eventually to the study of neutral species: radicals, metastable molecules, charge-transfer (CT) complexes, several of them are of great interest in atmospheric chemistry or as high-energy density materials. Among the simple, inorganic species discovered one can cite the hydrogen trioxide (HO3), important player in the terrestrial airglow and relevant to the ozone deficit problem; the [H2O+-O2-] CT complex, relevant to the photonucleation of water vapour; the tetraoxygen O4, and tetranitrogen N4 of interest to fundamental research, to the atmosphere of Titan, and as a high-energy density material. In this connection, according to the survey of the American Chemical Society, (Chemistry Highlights 2002, in Chemical & Engineering News V. 80, No. 50, p-42, December 2002) the discovery of tetranitrogen N4, published on Science in 2002, is the most significant result obtained worldwide in 2002 in the Inorganic Chemistry field. Finally, the first experimental proof of existence has been given of the long-sought after CS2OH radical, the role of which in the conversion of CS2 to OCS in the troposphere is found in every textbook of atmospheric chemistry. Her recent research interests have been focussing on the study of unconventional isotope effects and on gaseous metal-free models for hydrocarbons functionalization. She has proposed a double-well model for isotope effects associated with isotope-exchange reactions, and has also investigated charge and spin effects in the crucial C-H activation step of methane functionalization processes (Chemistry- Eur. J. 15, 4248, 2009). This study was recently proposed in Nature Chemistry as a new route to the conversion of methane into suitable compounds (Nature Chemistry, 1, 348, 2009). The study of ionic processes as a route to the formation of radicals and neutral species in the C-H bond activation, that is the tight link between ionic and neutral chemistry, has been recently selected as a “hot paper” in Angewandte Chemie (*Angew. Chem. Int. Ed. Engl.* 51, 1455, 2012).

Mother tongue(s) Italian

Other language(s)

Self-assessment	Understanding		Speaking		Writing
European level (*)	Listening	Reading	Spoken interaction	Spoken production	
English	C1	C2	C1	C1	C2

(*) Common European Framework of Reference for Languages

Annexes

References

Scientific Publication

1 Cacace F., de Petris G., Pepi F.
Gas-phase NO^+ Affinities.
Proc. Nat. Ac. Science 1997, 94: 3507

2 Cacace F., Cipollini R., de Petris G., Pepi F., Rosi M., Sgamellotti A.
Isotope Exchange in ionized O_3/O_2 Mixtures: the Role of O_5^+, a Unique O_n^+ Complex.
Inorg. Chemistry 1998, 37: 1398

3 Cacace F., de Petris G., Pepi F., Troiani A.
Experimental Detection of Hydrogen Trioxide.
Science 1999, 285: 81

4 Cacace F., de Petris G., Pepi F., Rosi M., Sgamellotti A.
Ionization of Ozone/Chlorofluorocarbon Mixtures in Atmospheric Gases. Formation and Dissociation of $[CHX_2O_3]^+$ (X=Cl,F) Complexes.
Angew. Chem. Int. Ed. Engl. 1999, 38: 2408

5 Cacace F., de Petris G., Pepi F., Troiani A.
Direct Experimental Evidence for the $H_2O^+O_2^-$ CT Complex: Crucial Support to Atmospheric Photonucleation Theory.
Angew. Chem. Int. Ed. Engl. 2000, 39: 367

6 Cacace F., Cipollini R., de Petris G., Rosi M., Troiani A.
A New Sulfur Oxide, OSOSO, and its Cation, Likely Present in the Io’s Atmosphere. Detection and Characterization by Mass Spectrometric and Theoretical Methods.
J. Am. Chem. Soc. 2001, 123: 478

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7 Cacace F., de Petris G., Rosi M., Troiani A.
Ionization of O_3 in Excess N_2. A New Route to N_2O via Intermediate $[N_2O_3]^+$ Complexes.
Angew. Chem. Int. Ed. Engl. 2001, 40: 1938
8 Cacace F., de Petris G., Rosi M., Troiani A.
S_3O, a new sulfur oxide identified in the gas phase.
Chem. Comm. 2001, 20: 2086
9 Cacace F., de Petris G., Troiani A.
Experimental Detection of Tetraoxygen.
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Experimental Detection of Tetranitrogen.
Science 2002, 295: 480
11 de Petris G.
Mass Spectrometric Contributions to Problems Related to the Chemistry of Atmospheres.
Acc. Chem. Res. 2002, 35: 305
12 Cacace F., de Petris G., Rosi M., Troiani A.
Carbon Tetroxide: Theoretically Predicted and Experimentally Detected.
Angew. Chem. Int. Ed. Engl. 2003, 42: 2985
13 de Petris G.
Atmospherically Relevant Ion Chemistry of Ozone and its Cation.
Mass Spectrom. Rev. 2003, 22: 251
14 de Petris G., Cacace F., Troiani A.
Discovery of Two High-Energy N_2O_2 Isomers.
Chem. Comm. 2004, 3: 326
15 de Petris G., Cartoni A., Rosi M., Troiani A., Angelini G., Ursini O.
Isotope Exchange in Ionized CO_2/CO Mixtures: the Role of Asymmetrical $C_2O_3^+$ Ions.
Chemistry- Eur. J. 2004, 10: 6411
16 de Petris G., Cacace F., Cipollini R., Cartoni A., Rosi M., Troiani A.
Experimental Detection of Theoretically Predicted N_2CO.
Angew. Chem. Int. Ed. Engl. 2005, 44: 462
17 de Petris G., Rosi M., Troiani A.
S_3O^+ and S_3O in the Gas Phase: Ring and Open-chain Structures.
Chem. Comm. 2006, 4416
18 de Petris G., Rosi M., Troiani A.
Direct Experimental Observation of CS_2OH.
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19 de Petris G., Rosi M., Troiani A.
SSOH and HSSO Radicals. An Experimental and Theoretical Study of $[S_2OH]^{0/+/-}$ Species.
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Isotope Effects in Isotope-Exchange Reactions: Evidence for a Large $^{12}C/^{13}C$ Kinetic Isotope Effect in the Gas Phase
J. Phys. Chem. A 2008, 112: 2507
21 de Petris G., Troiani A., Rosi M., Angelini G., Ursini O.
Methane Activation by Metal-free Radical Cations: Experimental Insight into the Reaction Intermediate.
Chemistry- Eur. J. 2009, 15: 4248
22 de Petris G., Cartoni A., Troiani A., Angelini G., Ursini O.
Water Activation by $SO_2^{\bullet+}$ Ions: An Effective Source of OH• Radicals.
Phys. Chem. Chem. Phys. 2009, 11: 9976
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Double C-H Activation of Ethane by Metal-Free $SO_2^{\bullet+}$ Radical Cations
Chemistry- Eur. J. 2010, 16: 6234
24 de Petris G., Cartoni A., Rosi M., Barone V., Puzzarini C., Troiani A.
The Proton Affinity and Gas-Phase Basicity of Sulfur Dioxide
ChemPhysChem 2011, 17: 112
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Linking Ion and Neutral Chemistry in C-H Bond Electrophilic Activation:
Generation and Detection of $HO_2^{\bullet}$ Reactive Radicals
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26 N. Dietl, A. Troiani, M. Schlangen, O. Ursini, G. Angelini, Y. Apeloig, G. de Petris, H.

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Schwarz
Mechanistic Aspects of Gas-Phase Hydrogen-Atom Transfer from Methane to $[CO]^{\bullet+}$ and $[SiO]^{\bullet+}$: Why do They Differ?
Chemistry- Eur. J. 2013, 19 : 6662.

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Iron-Promoted C-C Bond Formation in the Gas Phase.
Angew. Chem. Int. Ed. 2015, 54:14359

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Isomerization Pathways of ONCNO: Unstable or Metastable?
J. Phys. Chem. A 2016,120: 4812

Textbooks (Chapters, etc.)

G. de Petris
Atmospheric Studies by Laboratory Mass Spectrometers, p. 696
in Beauchemin D and Matthews DE editors, Elemental and Isotope Ratio Mass Spectrometry. Elsevier; 2010. (Gross ML and Caprioli RM, editors. The Encyclopedia of Mass Spectrometry; vol. 5)

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