

**TWENTY-FIRST INTERNATIONAL SUMMER SCHOOL ON
VACUUM, ELECTRON AND ION TECHNOLOGIES**

VEIT 2019

**23 - 27 September 2019
SOZOPOL, BULGARIA**

**PROGRAM
ABSTRACTS**

Editors: M. Dimitrova, Ch. Ghelev and E. Vasileva

ORGANIZED BY

INSTITUTE OF ELECTRONICS
BULGARIAN ACADEMY OF SCIENCES, SOFIA, BULGARIA

DUTCH INSTITUTE FOR FUNDAMENTAL ENERGY RESEARCH
EINDHOVEN, THE NETHERLANDS

CO-FINANCED by the
MINISTRY OF EDUCATION AND SCIENCE, BULGARIAN
SCIENCE FUND, Project № KP-06-MNF/21/16.07.2019



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MAIN SCIENTIFIC TOPICS:

- **THIN FILMS DEPOSITION**
- **SURFACES AND THIN FILMS PROCESSING AND ANALYSIS**
- **COATINGS FOR ADVANCED APPLICATIONS**
- **PLASMA-SURFACE INTERACTION AND PLASMA DIAGNOSTICS**
- **MODELING AND COMPUTER SIMULATION**

PLENARY AND POSTER SESSIONS:

**A: PLASMA-SURFACE INTERACTION AND PLASMA DIAGNOSTICS.
MODELING AND COMPUTER SIMULATION**

**B: THIN FILMS DEPOSITION.
COATINGS FOR ADVANCED APPLICATIONS**

C: SURFACES AND THIN FILMS PROCESSING AND ANALYSIS

ABBREVIATIONS:

**TL – TOPIC LECTURE
PR – PROGRESS REPORT
OP – ORAL PRESENTATION
PA – POSTER SESSION A
PB – POSTER SESSION B
PC – POSTER SESSION C**

PC-14**PHOTO-INDUCED FRAGMENTATION OF THE TITANIUM (IV) ISO-PROPOXIDE MOLECULE**

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Emerging techniques in nanoscience and nanotechnologies have become an essential tool in various disciplines. As a result, major improvements in the production new nanomaterials with specific physical and chemical properties have been achieved using different physical and chemical methods. Many of these methods lead to the deposition of arbitrarily shaped metallic, semiconducting or insulating nano-structures. It is known that the TiO₂ nanoparticles have good electrical, optical and magnetic properties and have found applications in optoelectronic devices, sensors, alloy materials, solar cells, and self-cleaning surfaces [1]. We present both experimental and theoretical results related to the photo-induced fragmentation of the core-excited titanium (IV) iso-propoxide Ti[OCH(CH₃)₂]₄ molecule, which is an organometallic precursor used for deposition of nano-sized TiO₂ films [2, 3]. The experiments were performed at the gas-phase photoemission beamline of the Elettra synchrotron radiation source (Trieste, Italy) [4-7]. Computational spectroscopy and extensive molecular dynamics (MD) simulations were used to investigate and characterize the main fragmentation channels observed in the mass spectra measured.

Acknowledgments: The work was partially supported by the MAECI Serbia–Italy Joint Research Project “A nanoview of radiation-biomatter interaction” and the MESTDRS (OI 171020, OI 172065).

[1] J. Bogdan *et al.* *Nanoscale Research Letters* (2015) 10:57, DOI 10.1186/s11671-015-0753-2.

[2] A. Sandell *et al.* *J. Appl. Phys.*, **92** 3381 (2002).

[3] A. Čenovar *et al.* *Advances in Natural Science: Theory & Applications*, **1** 133 (2012).

[4] J. Chiarinelli *et al.* *Frontiers in Chemistry*, **7** 329 (2019).

[5] P. Bolognesi *et al.* *Frontiers in Chemistry*, **7** 151 (2019).

[6] P. Bolognesi *et al.* *J. Chem. Phys.*, **145** 191102 (2016).

[7] P. Bolognesi *et al.* *Phys. Chem. Chem. Phys.*, **17** 24063 (2015).

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23 – 27 September 2019, Sozopol, Bulgaria

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INVITATION

Dear Colleague,

You are cordially invited to participate in the International Summer School on Vacuum, Electron and Ion Technologies. The 2019 edition is the 21th in a series of events organized with the aim to act as a forum for interchange and dissemination of knowledge and ideas on the latest developments in electron-, ion- and plasma-assisted technologies. It is a major scientific event and a meeting place for young scientists and distinguished speakers and experts from around the world focusing on the state-of-the-art scientific developments with emphasis on both the physics and the engineering aspects of these technologies which have become important research tools and production processes. The scientific program will include about 25 invited lectures and reviews. Contributed papers are also solicited and will be presented mainly in poster sessions. The informal atmosphere, combined with the spirit of the sea, will stimulate further collaborations and joint works.

The official language of the School is English

HISTORY OF VEIT

INTRODUCTION

The International Summer School on Vacuum, Electron and Ion Technologies is a biennial scientific event organized with the aim to act as a forum for interchange and dissemination of knowledge and ideas on the latest developments in electron-, ion- and plasma-assisted technologies. It is a major scientific event and a meeting place for young scientists and distinguished speakers and experts from around the world focusing on the state-of-the-art scientific developments with emphasis on both the physics and the engineering aspects of these technologies which have become important research tools and production processes. The scientific program will include about 25 invited lectures and reviews. Contributed papers are also solicited and will be presented mainly in poster sessions. The informal atmosphere, combined with the spirit of the sea, will stimulate further collaborations and joint works.

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Year	Number of Invited Speakers
1997	10
1999	12
2001	15
2003	18
2005	20
2007	22
2009	25
2011	28
2013	30
2015	32
2017	35
2018	38

NUMBER OF PARTICIPANTS (Past Years Editions)

Year	Number of Participants
1997	100
1999	120
2001	150
2003	180
2005	200
2007	220
2009	250
2011	280
2013	300
2015	320
2017	350
2018	380

NUMBER OF PAPERS (Past Years Editions)

Year	Number of Papers
1997	50
1999	60
2001	70
2003	80
2005	90
2007	100
2009	110
2011	120
2013	130
2015	140
2017	150
2018	160

TOPICS

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