

Workshop on Plasma-Based Synthesis of Nanomaterials

10. - 11. February 2020 Prague

List of contributions

February 10th – Monday

Session 1

Chairman – Jan Benedikt

Invited 1

Geometry, Shadow and Sheaths for the Nanostructuring of Thin Films

A. García-Valenzuela, M. Oliva-Ramírez, A. Palmero, R. Alvarez, A. Borrás,
M.C. López, **A. R. González-Elipe**

*Nanotechnology on Surfaces and Plasma Laboratory, Instituto de Ciencia de
Materiales de Sevilla (CSIC-Univ. Sevilla), Sevilla, Spain*

Oral 1

Thermal evolution of heterogeneous silver/plasma polymer nanoparticles studied by X-ray scattering methods

T. Košutová, L. Horák, A. Shelemin, M. Vaidulych, J. Hanuš, H. Biederman, O. Kylián,
P. Solař, M. Cieslar, A. Choukourov, M. Dopita

Faculty of Mathematics and Physics, Charles University, Prague, Czech Republic

Oral 2

Synthesis of gold ring-shape nanoparticles using co-sputtering over liquids

A. Chauvin¹, A.-A. El Mel², S. Konstantinidis³, P.-Y. Tessier², M. Dopita¹

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Invited 2

Plasma assisted synthesis of nanomaterials: challenges and prospects

O. Kylián, J. Hanuš, P. Solař, J. Kousal, R. Štefaníková, D. Nikitin, A. Kuzminova, P. Pleskunov, A. Choukourov, H. Biederman

Faculty of Mathematics and Physics, Charles University, Prague, Czech Republic

Session 2

Chairman – **Andrei Choukourov**

Invited 3

Nanostructured (bio)functional thin films

V. Stranak¹, J. Kratochvil^{1,2}, V. Prysiashnyi¹, F. Dyčka¹, Z. Hubicka³, J. Kousal², P. Kus², O. Kylian²

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Oral 3

Hybrid approach coupling Plasma Processes and injection of Colloidal Solutions for customized Nanocomposite thin films

M. Mitronika¹, J. Profili², A. Gouillet¹, L. Stafford², A. Granier¹, M. Richard-Plouet¹

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Oral 4

Plasma-assisted deposition of thin ITO film for optical-fibre-based biosensors

P. Sezemsky¹, J. Kratochvil¹, R. Bogdanowicz², M. Smietana³, D. Burnat², H. Wulff⁴, V. Stranak¹

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³*Gdansk University of Technology, Gdansk, Poland*

⁴*University of Greifswald, Greifswald, Germany*

Invited 4

Non-equilibrium atmospheric plasmas for nanomaterials

J. Benedikt, O. Hansen, J. Golda, S. Askari

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Oral 5

The wrinkling concept applied to plasma polymers: an innovative approach for controlling their nano-architecture

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Oral 6

N+-doped Graphene by Solution Plasma

S. Chae^{1,3}, P. Pornaroontham^{1,3}, R. Naraprawatphong^{1,3}, X. Wang^{1,3}, **N. Saito**^{1,2,3,4}

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Invited 5

Evolution of ionization fraction of sputtered species in standard, multi-pulse and reactive HiPIMS

P. Vašina, M. Fekete, K. Bernátová, P. Klein, J. Hnilica

Masaryk University, Faculty of Science, Brno, Czech Republic

Ferbruary 11th – Tuesday

Session 3

Chairman – **Vítězslav Straňák**

Invited 6

Nanostructured Coatings in Automotive Industry

J. Vyskočil

HVM Plasma Ltd., Prague, Czech Republic

Company 1

R. Förch, EurAg

Company 2

S. Hutton, Kratos

Company 3

L. Mikuličková, TTS

Company 4

T. Homola, Ropllass

Company 5

P. Tuček, Hella Autotechnik Nova

Oral 7

W-B-C Coatings Prepared by Magnetron Sputtering Utilizing Pulsed Plasma Excitation

P. Souček, S. Debnárová, M. Polaček, P. Klein, J. Hnilica, L. Zábranský, V. Buršíková, P. Vašina

Faculty of Science, Masaryk University, Brno, Czech Republic

Invited 7

Plasma technologies enabling mobile communication

M. Zeuner

Scia Systems GmbH, Chemnitz, Germany

Session 4

Chairman – **Petr Vašina**

Invited 8

PEM Based Ordered Superstructures as a Durable Support for Fuel Cell Catalyst

Y. Yakovlev, P. Kúš, J. Nováková, I. Matolínová, **V. Matolín**

Faculty of Mathematics and Physics, Charles University, Prague, Czech Republic

Oral 8

Deposition of antibacterial Ag/a-C:H nanocomposites on titanium substrates using a gas aggregation cluster source

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Oral 9

Synthesis of nanoparticles by magnetron sputtering of silver and gold onto castor oil

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Oral 10

Structure and properties of bixbyite-based Ta–O–N films prepared by HiPIMS

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Oral 11

The utilization of gas aggregated silver nanoparticles for the detection of small molecules for imaging MS

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Invited 9

Nanostructured Materials Based on Thin Films and Nanoclusters for Gas Sensing

S. Haviar

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Poster Session

February 10th – Monday

Poster 01

Fabrication of nanostructured surfaces by plasma-based sputtering for Raman spectroscopy

A. Kuzminova, M. Procházka, O. Kylián

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Poster 02

Ag@Ti core@shell nanoparticles prepared by in-flight Ti coating of Ag nanoparticles

H. Libenská¹, J. Hanuš¹, A. M. Ahadi², V. Červenková¹, M. Cieslar¹, T. Košutová¹, H. Biederman¹

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Poster 03

Plasma treatment of poppy seeds in fluidized bed reactor

J. Perner, M. Kormunda, J. Matoušek

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Poster 04

Sputtered titanium species dynamics in HiPIMS

J. Hnilica¹, N. Britun², P. Klein¹, R. Snyders^{2,3}, P. Vašina¹

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Poster 05

Tailor-made nanocomposites with multistage antibacterial action

J. Kratochvíl^{1,2}, O. Kylián², D. Kahoun¹, J. Lieskovská¹, H. Langhansová¹, J. Štěřba¹, J. Kousal², J. Hanuš², H. Biederman², V. Straňák¹

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Poster 06

Plasma-assisted growth of polyethylene fractal nano-islands on polyethylene oxide thin films

J. Májek¹, A. Choukourou¹, P. Pleskunov¹, D. Nikitin^{1,2}, R. Tafiichuk¹, A. Shelemin¹, J. Hanuš¹, M. Unger³, A. Roy³, A. Ryabov¹

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Poster 07

Effect of nitrogen on sputtered species number densities evolution in reactive HiPIMS

K. Bernátová, M. Fekete, P. Klein J. Hnilica, P. Vašina

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Poster 08

Composite nanoparticles from arrow shaped gas aggregation source

K. Škorvánková, P. Solař, J. Hanuš, M. Cieslar, T. Košutová, P. Kúš, O. Kylián, H. Biederman

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Poster 09

Time-resolved study of unipolar and bipolar HiPIMS for deposition of Co₃O₄ catalysts

R. Hippler, **M. Čada**, V. Straňák, Z. Hubička

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Poster 10

Synthesis and surface modification of light emitting silicon nanoparticles using non-thermal plasma techniques

M. Müller, P. Galář, K. Herynková, K. Kůsová

Institute of Physics, Czech Academy of Sciences, Praha, Czech Republic

Poster 11

Atmospheric pressure plasma engineering of perovskite films for highly-efficient perovskite solar cells

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Poster 12

Ionised density fraction of sputtered species in HiPIMS discharge excited in argon/acetylene gas mixture

M. Fekete, K. Bernátová, J. Hnilica, P. Souček, P. Klein, P. Vašina

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Poster 13

Plasma modification of Kapton by dielectric barrier discharge in air at atmospheric pressure

N. Khomiakova, J. Hanuš, O. Kylián

Faculty of Mathematics and Physics, Charles University, Prague, Czech Republic

Poster 14

Nanostructured CuWO₄/WO₃ Bilayers for Hydrogen Gas Sensing

N. Kumar, S. Haviar, J. Capek, P. Baroch

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Poster 15

Study of magnetron sputtered SnO₂ films interaction with palladium and methanol

O. Leiko, Y. Kosto, Y Yakovlev, J. Nováková, K. Mašek

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Poster 16

Embedding carboxylated nanoparticles into poly(ethylene oxide) plasma polymer matrix for tunable attachment of biomolecules

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Poster 17

Behaviour of spokes in reactive HiPIMS

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Poster 18

Plasma polymer nanoparticles: Do we understand their formation?

R. Štefaníková¹, O. Kylián¹, A. Kuzminova¹, A Choukourov¹, J. Hanuš¹, M. Cieslar¹, P. Kúš¹, J. Drewes², F. Ziegler², F. Faupel², H. Biederman¹

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Poster 19

High-performance Thermochromic VO₂-based Coatings Prepared on Glass by a Low-temperature Scalable Deposition

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Poster 20

Quantitative Structure-Activity Relationship for Carbons prepared by Solution Plasma

J.M. Moon^{1,3}, S.W. Chae^{1,3}, P. Pornaroontham^{1,3}, R. Naraprawatphong^{1,3}, X. Wang^{1,3}, **T. Watanabe**¹, N. Saito^{1,2,3,4}

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Poster 21

Plasma diagnostics in hybrid reactive pulsed HiPIMS magnetron sputtering system

Z. Hubička, M. Čada, P. Kšířová, M. Dvořáková, J. Olejníček, D. Tvarog

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Poster 22

The plasma hydrogenation of hedgehog-like ZnO nanopowder

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Poster 23

Stability and composition of thin PLA-like films

J. Kousal¹, **Z. Krtouš**¹, L. Hanyková¹, Z. Kolářová Rašková², J. Sedlaříková^{2,3}, L. Kučerová², I. Krakovský¹, P. Solář¹, A. Hurajová², H. Biederman¹, M. Lehocký^{2,3}

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