

Metal nanoparticles for advanced materials:

From theory to practice

Monday, 01/10/2012

09:30 Registration

11:30 Ioannis Remediakis

Department of Materials Science and Technology, University of Crete

Welcome

Session I: Microscopy of nanoparticles

Chair: P.Ziemann

11:50 **Three-dimensional characterization of nanoparticles by electron tomography**

M.D. Rossell¹, R. Erni¹, S. Van Aert², G. Van Tendeloo², K.J. Batenburg³

¹*Electron Microscopy Center, EMPA, Swiss Federal Laboratories for Materials Science & Technology, Dübendorf, Switzerland*

²*Electron Microscopy for Materials Research, EMAT, University of Antwerp, Antwerp, Belgium*

³*IBBT-Vision Lab, University of Antwerp, Wilrijk, Belgium*

12:20 **Nanoparticles studied by X-ray microscopy with high spatial and spectral resolution**

P. Guttman, K. Henzler, S. Werner, S. Rehbein, G. Schneider

Helmholtz-Zentrum Berlin für Materialien und Energie GmbH, Institute for Soft Matter and Functional Materials, Berlin, Germany

12:40 **Samarium-CNT interaction: HEXPS and HTEM**

A. A. El Mel¹, P. De Marco¹, R. Snyders¹, C. Bittencourt¹, J. Ghijsen², S. Thiess³, W. Drube³, X. Ke⁴, G. Van Tendeloo⁴

¹*ChiPS – University of Mons – Belgium*

²*LISE - University of Namur – Belgium*

³*Deutschen Elektronen Synchrotron DESY, D-22603 Hamburg, Germany*

⁴*EMAT – University of Antwerp – Belgium*

13:00

Lunch and discussion

Session II: Nanoparticles for catalysis

Chair: M.Culha

14:30 **Synthesis of Nanocatalysts within pH-responsive Polymeric Nanostructures**

S. H. Anastasiadis^{1,2}, M. Kaliva,^{1,3} K. Chistodoulakis,^{1,3} M.A. Frysali,^{1,2} L. Papoutsakis¹ and M. Vamvakaki^{1,3}

¹*Institute of Electronic Structure and Laser, Foundation for Research and Technology-Hellas, Heraklion Crete, Greece*

²*Department of Chemistry, University of Crete, Heraklion Crete, Greece*

³*Department of Materials Science & Technology, University of Crete, Heraklion Crete, Greece*

15:00 **Gold nanostructures: challenges and opportunities of wet synthesis**

N. Lopez, G. Novell-Leruth,

Institute of Chemical Research of Catalonia, ICIQ, Tarragona, Spain

15:30 **Hydrodechlorination of trichloroethylene over Pd-based nanostructures**

K. Honkala, J. Andersin

Department of Chemistry, Nanoscience Center, University of Jyväskylä, Finland

15:50

Coffee around posters

16:30

Customised transition metal oxide nanoparticles for the controlled production of carbon nanostructures

F. Dillon, K. Mandel, A. Ajayan, A. Koos and N. Grobert

Department of Materials, Parks Road, University of Oxford, Oxford, UK

17:00

Catalysis of novel organic transformations by supported gold nanoparticles

Manolis Stratakis

Department of Chemistry, University of Crete, Greece

17:20 -
18:00

Poster Session

Tuesday, 02/10/2012

Session III: Nanoparticles in applied science

Chair: K. Honkala

9:30

Structural Phase Transitions in FePt Nanoparticles: Chemical & Magnetic Consequences

L. Han, U. Wiedwald, and P. Ziemann

Institute of Solid State Physics, Ulm University, FRG

10:00

Enhanced performance in organic photovoltaic cells using surfactant free gold nanoparticles as additives

E. Stratakis¹, G. D. Spyropoulos¹ and E. Kymakis²

¹ *Institute of Electronic Structure and Laser (IESL), Foundation for Research and Technology-Hellas (FORTH), Heraklion, Greece and*

Dept. of Materials Science and Technology, University of Crete, Heraklion, Greece.

² *Center of Materials Technology and Photonics & Electrical Engineering Department, Technological Educational Institute (TEI) of Crete, Heraklion, Greece*

10:20

Current Analytical Strategies for Detecting Trace Amounts of Nanoparticles in the Environment

S.A. Pergantis, E.A. Kapellios

Environmental Chemical Processes Laboratory, Department of Chemistry, University of Crete

10:40

Coffee around posters

11:20

Dopant segregation in silicon nanoparticles

Alexandra Carvalho¹, Mark J. Rayson², Sven Öberg², Patrick R. Briddon³

¹ *Department of Physics, I3N, University of Aveiro, Aveiro, Portugal*

² *Department of Engineering Sciences and Mathematics, Luleå University of Technology, Luleå, Sweden*

³ *School of Electrical, Electronic and Computer Engineering, University of Newcastle upon Tyne, Newcastle upon Tyne, United Kingdom*

11:50

Diamond nanoparticles in amorphous matrices

George Kopidakis

Department of Materials Science and Technology, University of Crete

12:10

Discussion

13:00

Lunch

Session IV: Nanoparticle spectroscopy

Chair: K. Velonia

14:30 **Biomacromolecule Mediated Ag@Au Core-Shell Nanoparticles and their Performance as SERS Labels**

Mustafa Çulha, Burak Çağlayan, Ali Yasin Sonay and Mehmet Kahraman
Yeditepe University, Turkey

15:00 **Control of optical resonances and the near field around metallic nanoparticles**

B. Hourahine, F. Papoff
Department of Physics, SUPA, University of Strathclyde, UK

15:30

Coffee around posters

16:00 **Multi-scale modelling of hybrid molecule/metal nanostructures**

K. Jhonston², T. Rissanou¹, V. Harmandaris^{1,2}
¹*Department of Applied Mathematics, University of Crete*
²*Max Planck Institute for Polymer Research, Mainz, Germany*

16:20 **Spectroscopic signature of gold nanoparticles: a multi-scale simulation**

Georgios Barmparis, George Kopidakis and Ioannis Remediakis
Department of Materials Science and Technology, University of Crete

16:40

Discussion

20:30

Dinner

Wednesday, 03/10/2012

9:30

Open discussion

10:30

Posters

11:30

Closing remarks

Posters

Shape changes of Au nanoparticles in reactive environment

Georgios Barmparis and Ioannis N. Remediakis

Department of Materials Science and Technology, University of Crete, Heraklion, Crete, Greece

Immobilization of Polymer Microgels Containing Metal Nanocatalysts onto Inorganic Surfaces

M.A. Frysali,^{1,2} M. Kaliva,^{1,3} L. Papoutsakis,¹ M. Vambakaki^{1,3} and

S. H. Anastasiadis^{1,2}

¹ *Institute of Electronic Structure and Laser, Foundation for Research and Technology-Hellas, Heraklion Crete, Greece*

² *Department of Chemistry, University of Crete, Heraklion Crete, Greece*

³ *Department of Materials Science & Technology, University of Crete Heraklion Crete, Greece*

Computational Study of Carbon – based Nanostructured Materials

Aristea Maniadaki and Georgios Kopidakis

Department of Materials Science and Technology, University of Crete, Heraklion, Crete, Greece

Hybrid carbon/metal nanocomposite materials

C. Mathioudakis¹, P.C. Kelires¹, G. Vantarakis²

¹ *Research Unit for Nanostructured Materials Systems, Department of Mechanical and Materials Science Engineering, Cyprus University of Technology, Limassol, Cyprus*

² *Department of Materials Science and Technology, University of Crete, Heraklion, Crete, Greece*

Transition metal nanoparticles for hydrogen storage

George Psfogiannakis and George Froudakis

Department of Chemistry, University of Crete, Greece

Effect of Graphene on Polystyrene and Poly(Methyl Methacrylate) Structural and dynamical Properties

Anastassia N. Rissanou^{1,2} and Vagelis Harmandaris^{1,2}

¹ *Department of Applied Mathematics, University of Crete, Heraklion, Crete, Greece.*

² *Institute of Applied and Computational Mathematics, Foundation for Research and Technology Hellas, Heraklion, Greece.*

In Situ Hierarchical Formation of Giant Amphiphile Bionanoreactors

K. Velonia¹, E. Daskalaki²

¹ *Department of Materials Science and Technology, University of Crete, Heraklion, Crete, Greece*

² *Department of Chemistry, University of Crete, Heraklion, Crete, Greece*