Research Team name:
Technology Research Center Laboratory,
Selcuk University

Presenter name: Prof. Dr. Mustafa Ersoz

Team Presentation – Annual Workshop, COST Action MP1106
Dublin, September, 2012

Research Team Name: **Technology Research Center Laboratory, S.U.**

Number of team members: 20

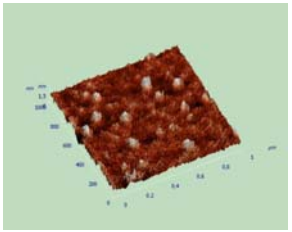
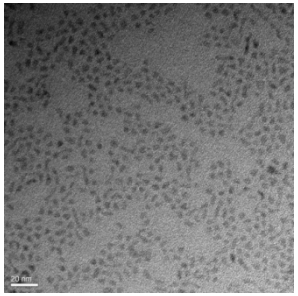
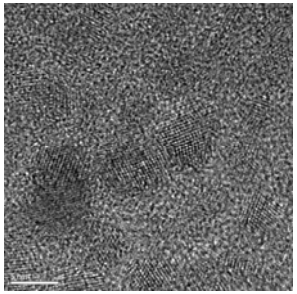
Brief description of team: studies, expertise, etc:

Team leader: Mustafa Ersoz, Prof. Physical Chemistry

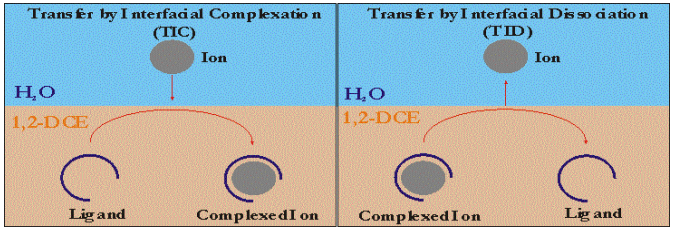
- 1 Assoc. Prof.
- 2 Assistant Prof.
- 3 Post doctoral fellow
- 6 Ph.D. students
- 8 M.SC. student

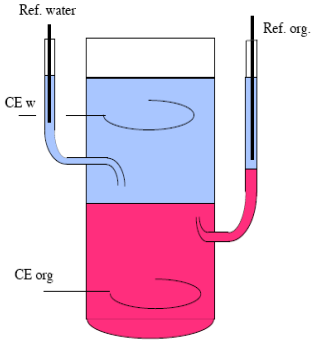
Research interests related to MP1106 (*please use bullets*):

✓Nanoengineered nanoparticles and Quantum dots for sensor

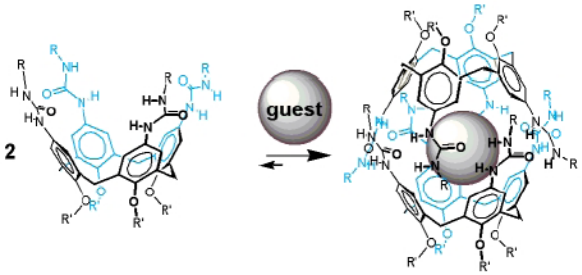






✓Electrochemistry at interfaces

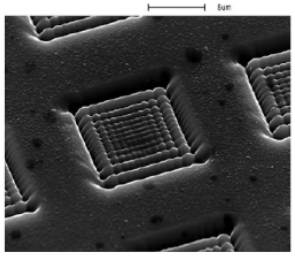


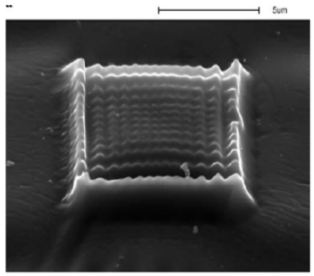


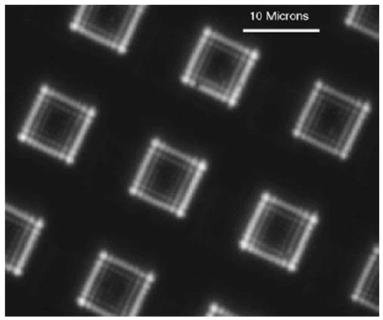
✓Micro ITIES for sensors



✓Patterning (hydrophilic /hyrdophobic areas) on the surfaces

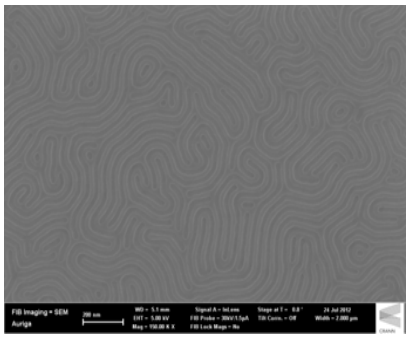


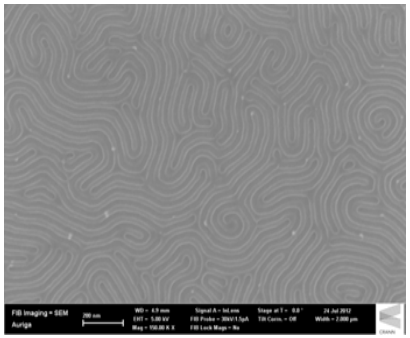




✓Chemical and physical (morphological) design of solid surfaces.

✓Manufacturing of patterned and structured surfaces , deposition, etching or other contemporary techniques.





✓Development of smart nanostructured interfaces

Basic facilities, equipment, devices etc

INFRASTRUCTURES & EQUIPMENT	
Nanotechnology	**Biotechnology**
✓ SEM (TEM for life sciences) ✓ ESR ✓ NMR ✓ XRD (GiSAXS) ✓ Femtosecond Laser-TOF system ✓ ICP-MS (Laser ablation) ✓ AFM-SNOM ✓ X-ray, fluorescence. ✓ Contact angle, LB film ✓ FTIR, UV-Vis ✓ Chromatography (HPCL, GPC., GC-MS, IC) ✓ Thermal Analysis (DSC, TGA, DTA) ✓ Submicron Particle Analyzer. ✓ Thin films laboratory ✓ Glove box (2 chambers able to work 8 person, including for the all necessary conditions) ✓ Solar Energy laboratory	✓ *Cell culture facilities (sterile cabin, incubators, microscopes, ELISA reader, centrifuge etc.)* ✓ *Microbial biotechnology laboratory (5L bioreactor, sterile cabin, incubators, shakers, centrifuge etc.)* ✓ *Molecular genetics laboratory (RT-PCR, electrophoresis and gel analysis systems, bioanalyzer, nanodrop)* ✓ *Bioactive compound preparation laboratory (ultrasonicator, homogenizator, freeze dryer, vacuum centrifuge)* ✓ *Fluorescent technology (Flow cytometer/ cell sorter, fluorescent spectrophotometer, fluorescent microscope)*

Research Areas;

✓Nanotechnology (synthesis, patterning, functionalisation, surface treatment and characterization of nanoparticles).
✓Synthesis of block copolymers
✓Synthesis of organic semiconductors such as perylene and naphthalene derivatives and their application in organic electronics, dye sensitized solar cells, organic and hybrid light emittin diodes,
✓Synthesis of nanoparticles, magnetic nanoparticles for different applications
✓Membrane technology (supported, activated and composite membranes, preparation and applications, UF/NF/RO processes and applications)
✓Electrochemistry at interfaces
✓Film preparation and composite processing : spin coating, doctor blade, Langmuir techniques, layer-by-layer assembly, electrodeposition

#1 project :

Title: **Nanoparticles-Based Hydrogen Generation at Water and Water/1,2- Dichloroethane (DCE) Interfaces**

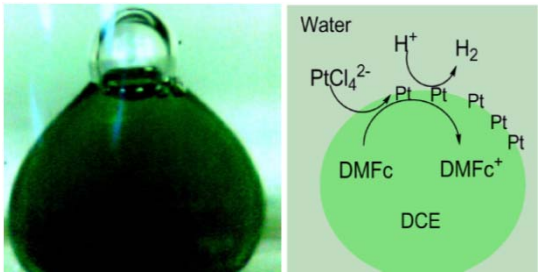
Duration: 36 months

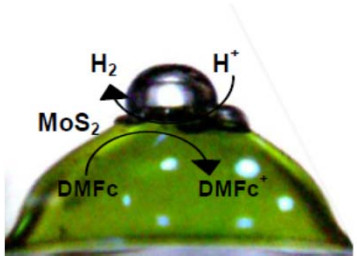
Funding organization: TUBITAK (Turkish Research and Technological Council)

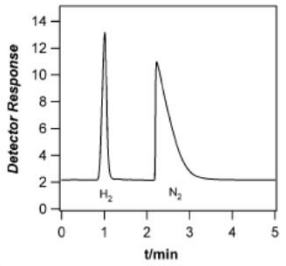
People involved and their function (*PhDs, postdocs, technicians etc*):
Prof. M. Ersoz, Dr. I. Hatay Patır, 2 PhD student

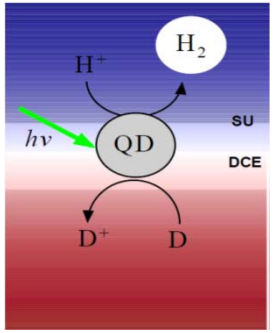
Facilities/equipment (*if not mentioned in Basics; may add photo*):
Cyclic Voltammetry, AFM, GC, Glove box. Etc.

Most interesting results (*1 or 2 plots max*): to produce hydrogen at water and water/DCE interfaces using synthesized semiconductor nanoparticles as catalysts.









#2 project :

Title: **Large Area Molecularly Assembled Nanopattern for Devices**

Duration: 36 months

Funding organization: **FP7-NMP**

People involved and their function (*PhDs, postdocs, technicians etc*):

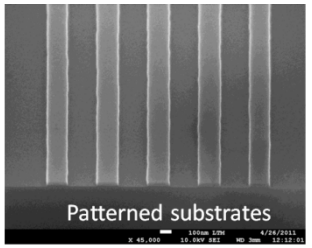
Prof. M. Ersoz, Dr. M. Kus, Dr. G. Arslan, Dr. I.H. Gubbuk, 2 PhD student

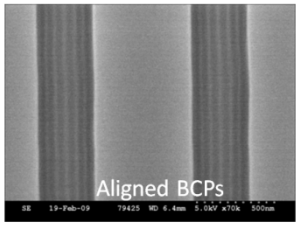
Facilities/equipment (*if not mentioned in Basics; may add photo*):

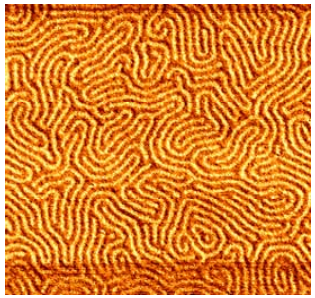
AFM, XRD-GISAXS, SEM and sythesis laboratory equipments, GPC etc.

Most interesting results (*1 or 2 plots max*):

- **WP leader**, Nanometrology development for self assembled structures
- Synthesis of BCPs and derivatives







#3 project :

Title: Investigation of colloidal and electrorheological responses of core/shell hybrid nano-structured and self assembled PEDOT on surface modified titanium dioxide having various geometries

Duration: 36 months

Funding organization: TUBITAK (Turkish Research and Technological Council)

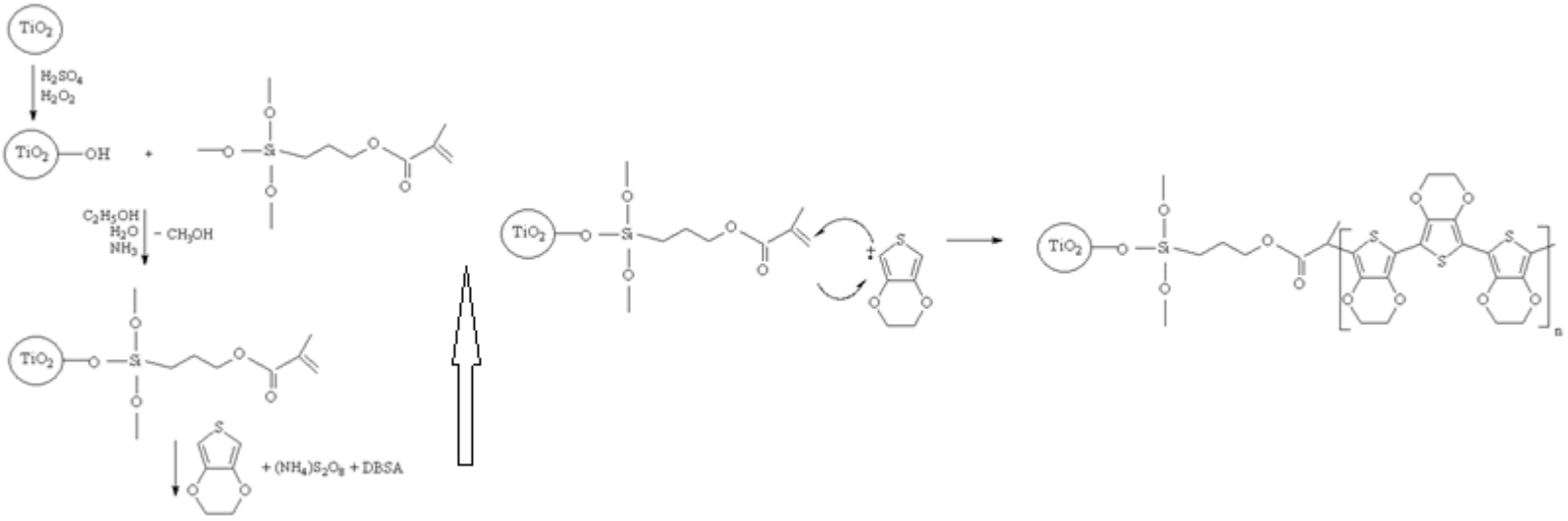
People involved and their function (*PhDs, postdocs, technicians etc*):

Prof. H.I. Unal, Prof. M. Ersoz, 2 PhD student

Facilities/equipment (*if not mentioned in Basics; may add photo*):

AFM, XRD-GISAXS, SEM and sythesis laboratory equipments, GPC etc.

Most interesting results (*1 or 2 plots max*):



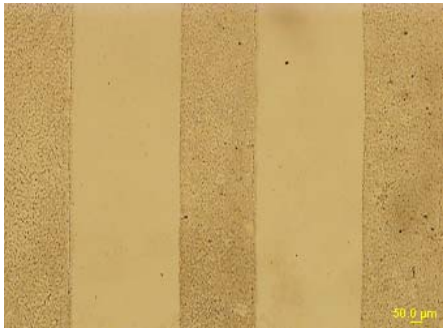
#4 project :

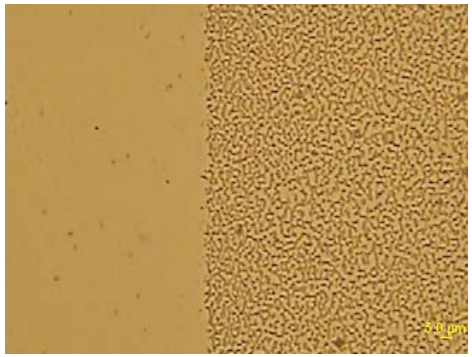
Title: **Selective Formation of Colloidal Particles Array on the Surfaces and Applications**

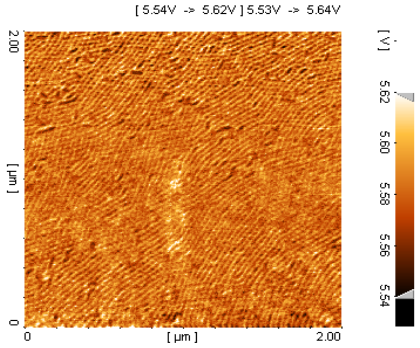
Duration: 36 months
Funding organization: TUBITAK

People involved and their function (*PhDs, postdocs, technicians etc*):
Prof. M. Ersoz, Dr. I. Hatay Patır, Dr. I.H. Gubbuk, Dr. G. Arslan and 3 PhD student

Facilities/equipment (*if not mentioned in Basics; may add photo*):
Most interesting results (*1 or 2 plots max*):







#5 project :

Title: **The European SOLAR Research Infrastructure for Concentrating Solar Power**

Duration: 48 months

Funding organization: **FP7-ESFRI**

People involved and their function (*PhDs, postdocs, technicians etc*):

Prof. M. Ersoz, Dr. Mahmut Kus, Dr. I. Hatay Patır

Facilities/equipment (*if not mentioned in Basics; may add photo*):

Most interesting results (*1 or 2 plots max*):

Konya Region is already approved as the energy industrial zone
Expected to be energy center and investment of many international
Energy leaders in the near future.

Topics for Research Proposal

The following topics under FP7-NMP 2013 Call,

NMP.2013.1.1-2 Self-assembly of naturally occurring nanosystems -developing of nano-, micro-, and macro-scale polymer composites

NMP.2013.1.2-1 Nanotechnology-based sensors for environmental monitoring

NMP.2013.1.3-1 Safety in nanoscale production and products

NMP.2013.2.1-1 Developing new precursors, new processing routes and functionalisations for carbon fibres

FoF.NMP.2013-10 Manufacturing processes for products made of composites or engineered metallic materials

NMP.2013.1.3-3 Development of a systematic framework for naming and assessing safety of the next generations of nanomaterials being developed for industrial applications

Thank you for attention