

# Workshop

4<sup>th</sup>-6<sup>th</sup> October, 2010

## Nanomaterials for Water Treatment

Opportunities & Barriers

An event organized by

**tecnalia**

Supported by:



**EUSKO JAURLARITZA  
GOBIERNO VASCO**

HEZKUNTZA UNIBERTSITATE  
ETA IKERKETA SAILA  
DEPARTAMENTO DE EDUCACIÓN  
UNIVERSIDADES E INVESTIGACIÓN

## Scope

### OBJECTIVES

To date, the world is facing great challenges in meeting the rising demands of potable water. Availability of freshwater supplies is decreasing in many regions of the world and pollution of surface and groundwater keeps growing. Water stress resulting from this situation has arisen strong concerns in the past years that are now reaching public awareness as well as political spheres. It is widely acknowledged that actual systems for water management or treatment are insufficient to face the coming water crisis. That is why these systems need to be strengthened by novel approaches.

Nanotechnology represents one of these promising novel approaches. Due to their outstanding properties, nanomaterials offer very attractive solutions to eliminate a wide range of contaminants, from toxic metal ions to microorganisms. Moreover, their increased surface area and thereby enhanced reactivity, reduces the amount of material necessary resulting in more efficient processes and material saving.

In this context, the workshop aims at gathering, not only scientific experts on environmental nanotechnology, but also water treatment industry and administration to create a privileged forum for exchange and discussion. During the debate the potential of nanotechnologies for water treatment will be analysed, taking into account technological opportunities and industry needs, as well as, the existing barriers slowing down their implementation. The workshop will have a special focus on the following topics:

- nZVI for groundwater remediation.
- TiO<sub>2</sub> for water decontamination.
- Potential environmental implications of nanomaterials.

### TARGET AUDIENCE

The Workshop will be relevant to anyone (in academia, national research institutes, administration or industry) with interest in the future challenges in water treatment and the opportunity that nanotechnology developments pose to overcome such challenges.

## Registration

### REGISTRATION FORM

Please, fill in and return by e-mail or fax no later than 10<sup>th</sup> September 2010.

Surname, First Name _____ Title _____	
Institution/Affiliation _____	
Position _____	
Mailing Address _____	
Post Code _____	Town _____ Country _____
Phone _____	Fax _____
E-mail _____	

Date \_\_\_\_\_ Signature \_\_\_\_\_

The registration fee is 650 EUR and includes, access to the presentations, meals and refreshments served during the workshop and the workshop dinner.

Please note that the number of participants is limited. Therefore, your registration confirmation will be communicated. Please wait until you receive your confirmation before making any travel plans and payment.

Once the registration confirmation has been communicated, please, enclose a copy of the bank transfer stating "Nanomaterials Workshop Tecnalia".

*Bank account No.: 0049 1800 17 2110392996 of the Banco Santander.*

*IBAN: ES52, BIC(SWIFT code):BSCHEM33.*

### CORRESPONDENCE

To register and for further information please contact:

M<sup>a</sup> Asunción Ruiz

E-mail: mar@labein.es

Phone: +34 94 607 34 69

Fax: +34 94 607 33 49

# Programme at a glance

## Day 1: 4<sup>th</sup> October

### Session 1: Opening session

- 10:00** Welcome coffee
- 11:30** Welcome - *Tecnalia*
- 12:00** TBD – *Michel Schouppe*
- 12:30** Challenges and Opportunities for Treating Emerging Contaminants in Water - *Paul Westerhoff (Arizona State University, USA)*
- 13:00** Lunch

### Session 2: nZVI for groundwater remediation

- 14:30** The Effect of Particle Size on Reactivity: From the Promise of Nanotechnology to the Reality of Environmental Engineering - *Paul G. Tratnyek (Oregon Health & Science University, USA)*.
- 15:00** Nanoscale Zero-valent Iron: Emplacement and effectiveness for in situ DNAPL source zone treatment determined in intermediate and large scale laboratory experiments - *Gregory V. Lowry (Carnegie Mellon University, USA)*.
- 15:30** In-situ reductive destruction of chlorinated solvents and immobilization of toxic metals in soils using polysaccharide-stabilized nanoparticles - *Dongye (Don) Zhao (Auburn University, USA)*.
- 16:00** Short break
- 16:15** Discussion
- 17:15** End of day 1

## Day 2: 5<sup>th</sup> October

### Session 3: Photocatalysis (1)

- 9:00** Requirements for nano-materials involved in the TiO<sub>2</sub>-based photocatalytic treatment of waters - *Jean-Marie Herrmann (IRCELYON, France)*
- 9:30** Decontamination of water by solar photocatalysis. Recent overview and trends - *Sixto Malato (Plataforma solar de Almeria, Spain)*
- 10:00** Discussion
- 11:00** Coffee break

### Session 3: Photocatalysis (2)

- 11:30** TBD - *Dionysios D. Dionysiou (University of Cincinnati, USA)*
- 12:00** Activity and Aging of supported TiO<sub>2</sub> photocatalysis- *Tecnalia*
- 12:30** Discussion
- 13:30** Lunch

### Session 3: Photocatalysis (3)

- 15:00** Photodegradation of organophosphate in water phase - *Nobuaki Negishi (National Institute of Advanced Industrial Science & Technology, Japan)*
- 15:30** Nano-titania for Photocatalytic Water Treatment - *John Byrne (NIBEC, The Nanotechnology and Integrated BioEngineering Centre)*
- 16:00** Discussion
- 17:00** End of day 2
- 21:00** Workshop dinner in Bilbao

## Day 3: 6<sup>th</sup> October

### Session 4: Potential environmental impacts of nanoparticles

- 9:00** Environmental Implications and Applications of Nanotechnology - *Pedro Álvarez (Rice University, USA)*
- 9:30** OECD Sponsorship Programme for the Testing of Manufactured Nanomaterials - *Mar González (OECD)*
- 10:00** Discussion
- 11:00** Coffee break
- 11:30** Fate, transport, biotoxicity and characterization of nanoparticles in aquatic systems – *Chris Impelliteri (US EPA)*
- 12:00** Challenges in assessing TiO<sub>2</sub> NP exposure in aquatic systems - *Rickard Arvidsson (Chalmers University, Sweden)*
- 12:30** Discussion
- 13:30** Lunch

### Session 5: General conclusions & closure

- 14:30** Workshop conclusions – *Tecnalia*
- 15:00** Final remarks – Workshop closure
- 16:00** End of day 3

Lecture rooms Olabeagas

c/Geldo – Edificio 700  
Parque Tecnológico de Bizkaia  
48160 – Derio (Bizkaia)  
Spain