NanoCatRed

Novel metallic NANOparticles on NANOstructured supports for oxyanion CATalytic REDuction in water

Several health risks have been associated with the occurrence of inorganic contaminants. Neither conventional nor advanced water treatment technologies have ticked in both efficiency and environmental criteria. NanoCatRed proposes the development of nanostructured catalysts to achieve a step-change in the performance of catalysts for hydrogenation of inorganic contaminants in water.

Keywords: Nanomaterials, catalytic hydrogenation, water treatment, inorganic contaminants

Start Date: **Duration:**   **Operation Code: 45925**

Main challenge/problem the project seeks to address

Several health risks have been associated with the occurrence of inorganic contaminants such as bromate, nitrate and perchlorate at concentrations more substantial than the background levels in surface and ground waters. Conventional water treatment technologies are not efficient in the removal of these pollutants, whereas other advanced technologies, such as ionic exchange, reverse osmosis, or electrodialysis, albeit effective in their removal, lead to highly concentrated secondary waste streams.

Proposed solution

The NanoCatRed project is designed to take advantage of two different concepts in heterogeneous hydrogenation catalysts to achieve a step-change in the efficiency of water purification applications: new methodologies for fabrication of more active/less costly metallic nanoparticles, and new methodologies for fabrication of nanostructured supports that can enhance the activity/selective/stability of the active metal phase. The technologies that the consortium will develop will be able to treat nitrate, perchlorate, and bromate in fresh water.

Innovative Potential

Catalytic hydrogenation is a promising technology for the removal of oxygen-containing anionic contaminants (oxyanions) such as bromate, nitrate, and perchlorate, from water, without generating concentrated secondary waste streams.

Target beneficiaries

The target market for the new technology includes the surface and ground water treatment sector.

Consortium

PORTUGAL
Adventech (Lead Beneficiary)
University of Porto
International Iberian Nanotechnology Laboratory (INL)

USA - UT AUSTIN'S PRINCIPAL INVESTIGATORS
Charles J Werth (Cockrell School of Engineering)
Simon M Humphrey (College of Natural Sciences)

Funding Sources Distribution

$ 595 034,00
UT Austin
(UT Austin Portugal Budget)

€ 610 978,87
PT2020 Incentive

€ 151 083,88
FCT Incentive

€ 96 436,81
Business Self Funding

Co-funded by:

NORTE2020
PROGRAMA OPERACIONAL REGIONAL DO NORTE

PORTUGAL 2020

UNIÃO EUROPEIA
Fundo Europeu de Desenvolvimento Regional

FCT Fundação para a Ciência e a Tecnologia

UTAustin Portugal