AOPs PhD School

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2nd Summer School on

Environmental Applications of Advanced Oxidation Processes

of the European PhD School on AOPs

and

NEREUS COST Action ES1403

Summer School on

Advanced Treatment Technologies and Contaminants of Emerging Concern

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SRE CM ASSOCIATE LABORATORY
LABORATORY OF SEPARATION AND REACTION ENGINEERING
LABORATORY OF CATALYSIS AND MATERIALS

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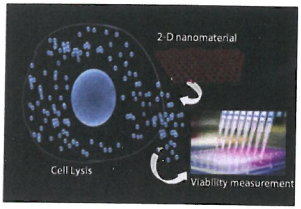
Cytotoxicity Evaluation of 2D Photocatalysts

OP28

*P. Ganguly[1,2], C. Byrne[1,2], S. Dervin[1,2], S. Hinder[3] and A. Breen[1,2],. S. C. Pillai[1,2]. (1) Nanotechnology and Bio-engineering Research Group, Institute of Technology Sligo, Sligo, Ireland, (2) Centre for Precision Engineering, Materials and Manufacturing Research (PEM), Institute of Technology Sligo, Sligo, Ireland. (3)The Surface Analysis Laboratory, Faculty of Engineering and Physical Sciences, University of Surrey, Guildford, Surrey, GU2 7XH, United Kingdom*Priyanka.Ganguly@mail.itsligo.ie*

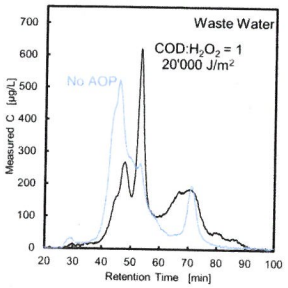


2-D semiconductor photocatalysts, has found significant attention for different energy and environmental applications. In view of this increased interest, we intend to look upon the cytotoxicity assessment of these materials. The present study aims to evaluate the toxic potential of 2-D photocatalysts and compare the results with bulk titania.. The cellular viability assessments will be performed on human lung carcinoma epithelial cells (A549) and assayed using Methylthiazolydiphenyl-tetrazolium bromide (MTT). The cell morphology will also be examined using Coomasie stain and evaluated using Fluroscence microscopy.

UV/H_2O_2 Brakes Down DOM Fractions from Lager to Smaller Apparent Molecular Weights: Investigations in Surface and Waste Waters

OP29

R. Wünsch[1,], J. Plattner[1], J. Svojitka[1].F, Eugster[2], M. Strässle[2], P. Temmler[2], R. Wülser[2], J. Gebhardt[3], T. Wintgens[1]. (1) University of Applied Sciences and Arts Northwestern Switzerland, Gründenstrasse 40, 4132 Muttenz, Switzerland, (2) Industrielle Werke Basel, Margarethenstrasse 40, 4002 Basel, Switzerland, (3) Xylem Services GmbH, Boschstraße 4, 32051 Herford, Germany; *robin.wuensch@fhnw.ch*

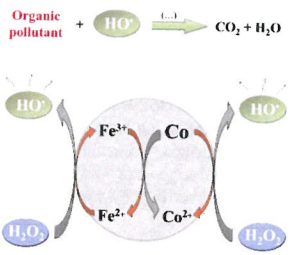


Advanced oxidation processes (AOPs) like the combination of hydrogen peroxide and low pressure UV with subsequent artificial recharge and re-abstraction are used in water reuse schemes to partially oxidize dissolved organic matter (DOM) and micropollutants. This study investigates the influence of AOP on size fraction characteristics of DOM analysed by LC-OCD, both in lab tests with synthetic and different real waters (surface water and effluent from different wastewater treatment plants) and in pilot tests with two different surface waters. Generally speaking, a shift from higher to lower apparent molecular sizes is observable. Pilot plant tests reveal an enhanced DOC removal efficiency after AOP in a simulated soil passage, demonstrating the beneficial effect of the AOP as a suitable treatment step in drinking water treatment and water reuse schemes.

Development of Bimetallic Iron-Cobalt Hybrid Magnetic Carbon Composites for Catalytic Wet Peroxide Oxidation

OP30

R.S. Ribeiro[1,2,], A.M.T. Silva[1], J.L. Faria[1], H.T. Gomes[2]. (1) Associate Laboratory LSRE-LCM, Faculty of Engineering, University of Porto, Rua Dr. Roberto Frias, Porto, Portugal, (2) Associate Laboratory LSRE-LCM, Polytechnic Institute of Bragança, Campus de Santa Apolónia, Bragança, Portugal; *rui.ribeiro@ipb.pt*



Catalyst design plays a crucial role in catalytic wet peroxide oxidation (CWPO), since this water/wastewater treatment technology relies on the catalytic decomposition of hydrogen peroxide via hydroxyl radicals formation. The combination of highly active and magnetically separable iron-based catalysts with the easily tuned properties of carbon-based materials allows superior performances in CWPO. Our work has been focused on the simultaneous incorporation of cobalt and iron species within carbon frameworks. Under this context, carbon decorated and· carbon encapsulated composites were successfully applied in a broad range of CWPO applications, including the treatment of contaminants of emerging concern and industrial effluents. The enhanced performance of bimetallic catalysts for CWPO was explained in terms of a detailed surface catalytic reaction mechanism.

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