Abstract book

SPEA9 Abstract book • Strasbourg • June 13-17 • 2016

organizing chair Nicolas Keller
organizing co-chair Didier Robert

9th European meeting
on Solar Chemistry and Photocatalysis:
Environmental Applications

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Session 4 **IMPROVING PHOTOCATALYTIC PROCESSES**
Session Chairs : Joaquim Luís Faria, Jaime Gimenez Farreras

14:00 - 14:30 **KN-1** **Contaminant Abatement Strategies for Heterogeneous Solar Photocatalytic Processes.**
Joaquim Luís Faria
Laboratory of Separation and Reaction Engineering - Laboratory of Catalysis and Materials (LSRE-LCM), Faculdade de Engenharia da Universidade do Porto, Porto, Portugal

14:30 - 16:10 OC-11 **A collection of chemical reaction engineering solutions in photocatalysis**
G. Camera Roda*, University of Bologna, DICAM, Bologna, Italy*
V. Loddo, L. Palmisano, F. Parrino, University of Palermo, DEIM, Palermo, Italy

OC-12 **Correlation between specific surface and photocatalytic performances of media integrated in a photoreactor**
Gael Plantard*, Vincent Goetz*
PROMES, CNRS UPR 8521, University of Perpignan, Tecnosud, Perpignan, France

OC-13 **Intensification of Heterogeneous TiO_2 Photocatalysis Using an Innovative Microreactor for Cr(VI)**
B.A. Marinho, R. Djellabi, R.O. Cristóvão, J. Loureiro, R.A.R. Boaventura, M.M. Dias, J.C. Lopes, ***V.J.P. Vilar***
LSRE – LCM Associate Laboratory, Faculdade de Engenharia, Universidade do Porto, Porto, Portugal.

OC-14 **One compound, two different photocatalysts: anatase-TiO_2 versus rutile-TiO_2**
Wojciech Macyk, *Marta Buchalska, Marcin Kobielusz, Anna Matuszek, Michał Pacia, Szymon Wojtyła. Jagiellonian University, Faculty of Chemistry, Kraków, Poland*

OC-15 **Urban biowaste derived substances as a tool for obtaining magnetsensitive materials for caffeine photodegradation**
A. Bianco Prevot*, F. Franzoso, G. Magnacca, R. Nisticò, Università di Torino, Torino, Italy*
L. Carlos, PROBIEN (CONICET-UNCo), Neuquén, Argentina
D. Martire, Universidad Nacional de La Plata, La Plata, Argentina

16:10 - 16:30 **COFFEE BREAK**

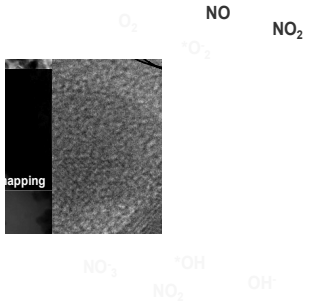
Session 5 **PHOTOCATALYTIC SURFACES AND MEMBRANES**
Session Chairs : Claudio Minero, Josef Krysa

16:30 - 18:10 OC-16 **Modeling the Contact Angle vs. Time for Photocatalytic Surfaces**
David Ollis
Chemical and Biomolecular Engineering, North Carolina State University, Raleigh, NC, U.S.A.

OC-17 **New Insights In Photocatalytic Membranes For Water Treatment**
Stephan Brosillon, *Julie Mendret, Jean-Pierre Mericq, Matthieu Rivallin, Catherine Faur, André Ayral*
Institut Européen des Membranes, CNRS-ENSCM-Université de Montpellier, Montpellier, France

Tailoring the g-C_3N_4/TiO_2 composite photocatalysts for NO_x removal OC-10

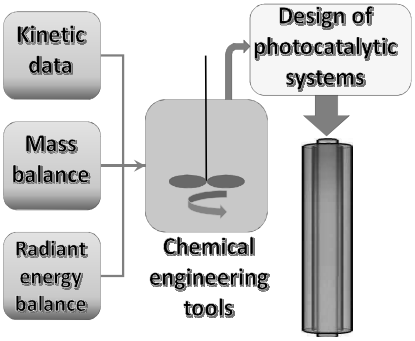
*C. **Trapalis**, I. Papailias, T. Giannakopoulou, N. Todorova, Institute of Nanoscience and Nanotechnology, NCSR "Demokritos", Agia Paraskevi, Attikis, 15343, Greece. c.trapalis@inn.demokritos.gr*



Graphitic carbon nitride/titania (g-C_3N_4/TiO_2) composite photocatalysts with different C_3N_4/TiO_2 ratios were synthesized by a simple preparation route. The photocatalytic activity of the composites was evaluated using NO as a target inorganic air pollutant. The conduction band edges position determined by electrochemical measurements using Mott-Schottky relation. Under visible light, the g-C_3N_4/TiO_2 composite with initial ratio 1:4 exhibited superior photocatalytic activity in NO oxidation in comparison to the pure semiconductors g-C_3N_4 and TiO_2. This finding was explained to be a result of a combination of the optical and electronic properties of the composites.

A collection of chemical reaction engineering solutions in photocatalysis OC-11

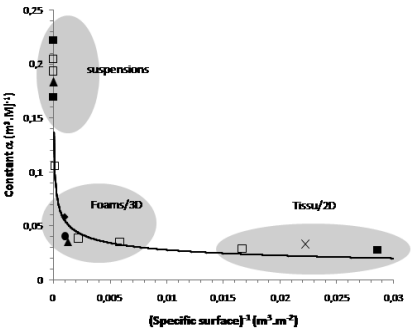
***G. Camera Roda,**[1] V. Loddo,[2] L. Palmisano,[2] F. Parrino[2] (1) University of Bologna, DICAM, Via Terracini 28, 40126 Bologna, Italy. giovanni.cameraroda@unibo.it (2) University of Palermo, DEIM, Viale delle Scienze building 6, 90128 Palermo, Italy.*



There are problems in photocatalysis that researchers cannot disregard in a rigorous study of photocatalytic systems. For instance: (i) How to perform a correct kinetic analysis with slurry systems? (ii) In photocatalytic slurry systems which is the parameter that should be preferred between catalyst load and catalyst concentration? (iii) Is Langmuir-Hinshelwood type kinetics a satisfactory representation of the observed reaction rate? (iv) "The COD removal efficiency with photocatalyst xx achieved 95% after 8h reaction time." Does this sentence give some insight on the photocatalytic activity of the tested material? (v) May mass transfer limit the reaction rate in slurry systems? (vi) With photocatalytic films, may mass transfer limit the reaction rate? (vii) How to scale up a photocatalytic reactor? The purpose of the present work is to show how chemical reaction engineering can answer to the previous questions, thus helping scientists to face researches on photocatalysis more successfully and consistently.

Correlation berween specific surface and photocatalytic performances of media integrated in a photo-reactor OC-12

***Gael Plantard**[1,2] Vincent Goetz,[2] (1) University of Perpignan, France, (2) PROMES, CNRS UPR 8521, France. plantard@univ-perp.fr Tecnosud, PROMES, rambla de la thermodynamique, 66100 Perpignan*



We use specific surface area to assess the performances of photocatalytic media. The photocatalytic media compared were selected to cover a wide range of specific surface areas, i.e. powder suspensions, 2D media (tissue, glass rods), foams and fiber stacks. We study and rank the media in terms of their photocatalytic performances. We define the configurations of photocatalytic media that make the best use of all available incident light in a given photoreactor geometry, and to adapt the media format to in-use constraints (depth, volume, light flux density). Ranked into ascending order of increasingly active specific surface area (expressed in $m^2.m^{-3}$), the results read as follows: cellulosic tissue < metallic fibers < reticulated foams < powder suspensions.