

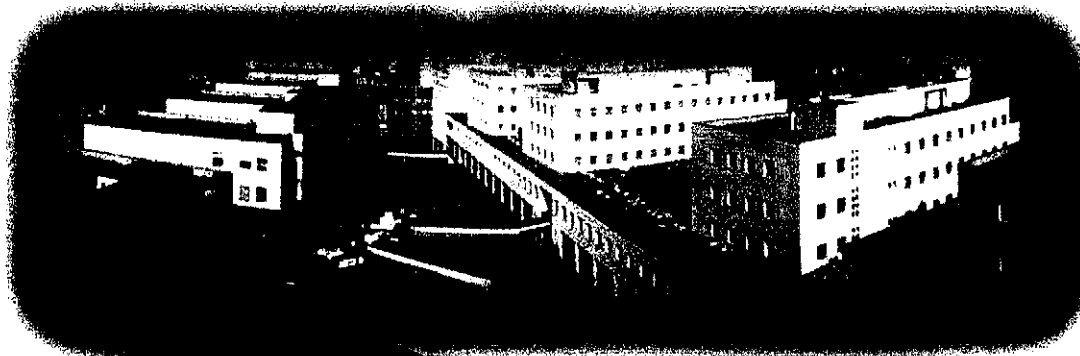
***12th International Chemical
and Biological Engineering
Conference***

PORTO 10-12 SEPT.

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FEUP FACULDADE DE ENGENHARIA
UNIVERSIDADE DO PORTO



ORDEM
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 **PORTO**
FEUP FACULDADE DE ENGENHARIA
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ENGENHEIROS**

10 – 12 Sept. 2014

PORTO

PORTUGAL

**12th International Chemical and Biological
Engineering Conference**

**BOOK OF
SHORT ABSTRACTS**

This volume contains the short abstracts presented at the 12th International Chemical and Biological Engineering Conference - CHEMPOR 2014, held in Porto, Portugal, between September 10th and 12th, 2014.

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Thermodynamic Analysis of Glycerol Steam Reforming for Hydrogen Production With in Situ Hydrogen and Carbon Dioxide Separation	
O-FP4	17
J.M. Silva, M.A. Soria, L.M. Madeira	
Implementation of a Simulated Moving Bed Reactor process for the synthesis of acetals: The Glycerol Ethyl Acetal case study	
O-FP5	17
R. Faria, C. Pereira, V. Silva, J. Loureiro, A.E. Rodrigues	
Purification of the Polyphenolic Fraction from <i>E. globulus</i> Bark Extract by Membrane and Adsorption Processes	
O-FP6	17
I. Mota, P.C. Pinto, C. Pereira, J. Loureiro, A.E. Rodrigues	
Optimization of the Adsorption Process for the Analytical and Preparative Separation of Nadolol Stereoisomers	
O-FP7	18
A.E. Ribeiro, A.E. Rodrigues, L.S. Pais	
Hydrogenation of Nitrobenzene over Pd/Al₂O₃ catalyst - Mechanism and effect of the main operating conditions	
O-FP8	18
C. Sá Couto, L.M. Madeira, C.P. Nunes, P. Araújo	
Heterogeneous Photocatalytic Synthesis of p-Anisaldehyde from p-Methoxytoluene in a Small Batch Reactor under UV-LED Irradiation	
O-FP9	18
D. Heggo, H. Mohamed, S. Ookawara, Y. Matsushita	
An Analysis of Ceramic Catalysts Comprised by Iron and Cobalt Oxides for the Heterogeneous Fenton's Reaction	
O-FP10	19
A.F. Rossi, R.C. Martins, R.M. Quinta-Ferreira	
Mass-transfer in narrow rectangular channels with mesh-type spacers under pulsatile flow in laminar regime	
O-FP11	19
C. Rodrigues, V. Semião, V. Geraldes	
Electrochemical Impedance Spectroscopy Measurements During Chlorine-Evolution Reaction	
O-FP12	19
J.F. Silva, A.C. Dias, P. Araújo, C.M.A. Brett, A. Mendes	
On the selection of the working conditions to precipitate Polystyrene wastes from Limonene solutions	
O-FP13	20
C. Gutiérrez, J.F. Rodríguez, I. Gracia, A. de Lucas, M.T. García	
Systematic Parameter Estimation for Equilibria Data With Thermodynamic Consistency Metrics and Phase Stability	
O-FP14	20
J.F.O. Granjo, N.M.C. Oliveira, J.A.P. Coutinho	

ORAL SESSION - CHEMICALS AND MATERIALS

Effect of Finishing Methods on Fragrance Release of Functional Wool/Poly	
O-CM1	
I.M. Martins, M.F. Barreiro, A.E. Rodrigues	
Correlating Adsorption and Flocculation Kinetics of Polyelectrolytes with I Architectures	
O-CM2	
M. G. Rasteiro, I. Pinheiro, H. Ahmadloo, D. Hunkeler, F.A.P. Garcia, P. Ferreira an	
Effect of an Additive on the Permanent Memory Effect of Polymer Disperse Crystal Films	
O-CM3	
M.C. Silva, J. Sotomayor, J. Figueirinhas	
Photopolymerized Polymethacrylate Resin for Thiocyanate/Phenol Separation	
O-CM4	
A.M. López, A. Villa-Garcia, M. Rendueles, M. Díaz	
Preparation of hydroxyapatite nanodispersions in the presence of chitosan	
O-CM5	
G. Ruphuy, A. Saralegi, J.C.Lopes, M.M. Dias, M.F. Barreiro	
The Alkalinity in Crosslinking of Hyaluronic Acid with Divinyl Sulphone In Properties of the Microparticles as Biomaterial	
O-CM6	
M.H.A. Santana, A.A Shimojo	
Production of RAFT Imprinted Smart Hydrogel Particles in a Continuous Flow reactor	
O-CM7	
C. Machado, A. Freitas, P. Kadhivel, R.C.S. Dias, M.R.P.F.N. Costa	
Continuous Production of high Quality Nanoparticles of Metal-Organic Frameworks	
O-CM8	
M. Costa, C.M. Fonte, P. Horcajada, T. Devic, J. Faria, M.M. Dias, J.C.Lopes	
Fatty Acid Derivatives: a New Approach to Develop Waterborne Paints With Low emissions	
O-CM9	
J.V. Barbosa, A. Mendes, F.D. Magalhães, M.M.S.M. Bastos	
Rheological Behavior of Nonionic Surfactant-based Gels	
O-CM10	
G.A.S. Nóbrega, D.A.A. Gomes, A.A. Dantas Neto, E.L. Barros Neto, T.N.C. Dantas	
ORAL SESSION - EDUCATION AND SOCIETY	
Shaking up final oral evaluations: Poster-Karaoke in Chemical Engineering Laboratories	
O-ES1	
A.B. Timmons, F.A. Da Silva	
Evaluating the Effectiveness of Teaching Core Chemical Engineering Knowledge Competencies in Higher Education - iTeach project	
O-ES2	
J. Glassey, N. Kockman, V. Meshko, M. Polakovic, E. Schaer, L.M. Madeira	

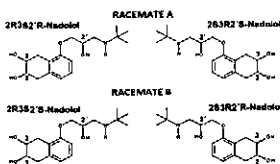
Optimization of the Adsorption Process for the Analytical and Preparative Separation of Nadolol Stereoisomers

O-FP7

A.E. Ribeiro^{1,*}, A.E. Rodrigues¹, L.S. Pais¹

⁽¹⁾ Laboratory of Separation and Reaction Engineering, Associate Laboratory LSRE/LCM, School of Technology and Management, Polytechnic Institute of Bragança, Campus de Santa Apolónia, Apartado 1134, 5301-857 Bragança, Portugal; *Corresponding author: aribeiro@ipb.pt

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Molecular structures of the four nadolol stereoisomers

The screening of different solvents and solvents mixtures for the analytical and preparative separation of nadolol stereoisomers using two chiral stationary phases is presented.

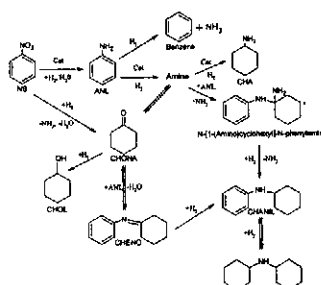
The experimental results are analysed through different strategies of liquid chromatographic separation depending on the target compound to be separated from a quaternary chiral racemic mixture.

The wide range of present results can be very useful both for the analytical or preparative separation of nadolol in order to better characterize the pharmacological and therapeutical behaviour of all single stereoisomers of this beta-blocker pharmaceutical drug.

Hydrogenation of Nitrobenzene over Pd/Al₂O₃ catalyst – Mechanism and effect of the main operating conditions

O-FP8

C. Sá Couto^{1,*}, L.M. Madeira², C.P. Nunes¹, P. Araújo¹. (1) CUF – Químicos Industriais, S.A., Quinta da Indústria, 3860-680 Estarreja, Portugal. (2) LEPABE, Departamento de Engenharia Química, Faculdade de Engenharia, Universidade do Porto, Rua Dr. Roberto Frias s/n, 4200-465, Porto, Portugal. (3) CPQ/DEQ, Instituto Superior Técnico, Universidade de Lisboa, Av. Rovisco Pais, 1049-001 Lisboa, Portugal.; * clara.couto@cuf-qi.pt

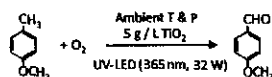


The catalytic hydrogenation of nitrobenzene was studied in a three-phase basket reactor. The catalyst used was a commercial 1 wt.% Pd/Al₂O₃ sample in spherical form and the samples collected during the experiments in the batch reactor were analysed by gas chromatography. The kinetic experiments allowed to better understand the mechanism behind aniline and secondary products formation, a topic not well understood and for which information available in the literature is scarce. The effect of temperature, pressure and nitrobenzene concentration were studied and it was found that there are more secondary products than those referred in the literature; in particular, the formation of benzene was elucidated. It was found that both the reaction kinetics and selectivity are strongly dependent on the temperature while the effect of total pressure is not that pronounced.

Heterogeneous Photocatalytic Synthesis of p-Anisaldehyde from p-Methoxytoluene in a Small Batch Reactor under UV-LED Irradiation

O-FP9

D. Heggo^{1,*}, H. Mohamed², S. Ookawara^{1,2}, Y. Matsushita¹. (1) Egypt-Japan University of Science and Technology, Borg El-Arab, Alexandria, Egypt. (2) Tokyo Institute of Technology, Tokyo, Japan; * dalia.heggo@ejust.edu.eg



1 hour: Conversion = 19 % Selectivity = 95 %
3 hour: Conversion = 58 % Selectivity = 72 %

The small scale of batch reactor with the use of UV-LED lamp enabled heterogeneous photocatalytic synthesis of p-Anisaldehyde (P-MB) from p-Methoxytoluene with high productivity and high selectivity. Compared to the previous work in the literature, the generation rate (GR) of P-MB per power was 13-fold faster, while the GR of P-MB per power per volume was more than 1000-fold faster. The conversion, selectivity and irradiation time were 58%, 72% and 3 hours in this work, while 75%, 60% and 48 hours in the previous work. With a fixed flow rate of oxygen bubbling, the GR of P-MB increased with the UV intensity without significant decrease of selectivity. With a fixed UV intensity, on the other hand, the flow rate of oxygen bubbling did not affect the GR of P-MB and selectivity in the higher flow rate range.