5th Portuguese Young Chemists Meeting

(5th PYCheM)

&

1st European Young Chemists Meeting

(1st EYCheM)

Centro Cultural Vila Flor

Guimarães, Portugal

26th – 29th of April

ICVS/3B's

Câmara Municipal de Guimarães

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General Programme

	26 April	27 April	28 April	29 April
9:00-13:20	Registration and Workshop of Open Science and European Open Access Policies in H2020	Organic Chemistry and Medicinal Chemistry	Inorganic, Physical, Analytical and Electrochemistry	Materials Chemistry and Nanomaterials and Surface Chemistry
13:30	Opening Ceremony	Lunch	Lunch	Lunch
14:00 - 18:00	Green Chemistry + Chemistry of Natural Products	Biochemistry and Medicinal Chemistry	CHEM2NATURE Symposium Chemical strategies for modification of natural origin materials Assembleia GQJ (17h)	Materials Chemistry and Nanomaterials and Surface Chemistry
18:00		Walking Tour		Closing Ceremony
19:00	Welcome Cocktail		Gala Dinner	
21:30	Get-together night			

28th April

9h00	Inorganic chemistry + Physical chemistry + Analytical chemistry + Electrochemistry **Chair:** Dra. Fátima Bento **Young chair:** Cátia Santos Moreira	**PL4 - Ei-ichi Negish** **Nobel Prize in Chemistry 2010** **(50+10)** **"Magical Power of d-Block Transition Metals as Catalysts for Organic Synthesis: Principles and Examples"**
10h00		**IL6 - Edward Matthijs (30+5)** **"Electrodeposition of copper-zinc-tin alloys from pyrophosphate electrolytes followed by selenization for CZTSe photovoltaics"**
10h35		OP27- Micro- and Nano-Sized Lanthanide-Organic Frameworks: Photoluminescent and Catalytic Materials **Sérgio Manuel Felipe Vilela (10+5)**
10h50		OP28- Density Functional Theory calculation for direct transition mechanism for Molecular Diffusion in type I gas hydrates **Ángel Vidal Vidal (10+5)**
11h05		**Coffee break + Poster Session**
11h35	Inorganic chemistry + Physical chemistry + Analytical chemistry + Electrochemistry **Chair:** Dr. Edward Matthijs **Young chair:** Sebastian Sobottka	OP29- Optimization of Reaction Parameters for the Electrochemical Synthesis of Silver Sub-nanometric Naked Clusters **Jose Manuel Blanco Trillo (10+5)**
11h50		OP30- Crocin and β-Carotene Bleaching Assays as Analytical Tools in the Optimization of the Extraction of Hydrophilic and Lipophilic Antioxidants from Tomato **José Virgílio Santulhão Pinela (10+5)**
12h05		OP31- Chemical characterization of malodors of an animal by-products processing industry **Hugo Miguel Rodrigues Cunha Oliveira (10+5)**
12h20		OP32- Determination of ammoniacal nitrogen in silages using gas-diffusion microextraction (GDME) and fluorimetric detection **Inês Maria Afonso Valente (10+5)**
12h35		OP33- Development of an ethambutol sensor based on electrochemistry **Rosa Alexandrina de Sousa Couto (10+5)**
12h50		OP34- One-pot synthesis of reduced graphene oxide/Co3O4 nanograins for electrochemical detection of dopamine in the presence of uric acid, glucose and ascorbic acid **Numan Arshid (10+5)**
13h05		OP35- Automated cytochrome c oxidase bioassay developed for ionic liquids' toxicity assessment **Susana Patrícia Fontes da Costa** (10+5)

13h20		**Lunch**
14h20	CHEM2NATURE's Symposium: "Chemical strategies for the modification of natural origin materials" **Chair:** Professor João F. Mano **Chair:** Dr. Ricardo Pires	**IL7 - Berit L. Strand (30+5)** **"Chemoenzymatic modification of alginates for tissue engineering applications"**
14h55		**IL8 - Thomas Groth (30+5)** **"Surface modifications with glycosaminoglycans - from control of cell adhesion to cell differentiation and anti-inflammatory activity"**
15h30		OP36- Mechanically Reinforced Hydrogel Fibers for Tendon Tissue Engineering **Raquel Carvalho de Ferreira Costa e Almeida (10+5)**
15h45		OP37- Anticancer activity of extracts of sea anemones in human gastric adenocarcinoma cells **Tânia da Costa e Silva (10+5)**
16h15		**IL9 - Laura Cipolla (30+5)** **"Glycomics at the Interface: Synthesis and Biological Properties of Carbohydrate-modified biomaterials"**
16h30		**Coffee Break + Poster Session**
17h00		**Assembleia GQJ**
19h30		**Congress dinner**

OP30 - Crocin and β-Carotene Bleaching Assays as Analytical Tools in the Optimization of the Extraction of Hydrophilic and Lipophilic Antioxidants from Tomato

José Pinela[1,2], M.A. Prieto[1,3], Maria Filomena Barreiro[4], Ana Maria Carvalho[1], M. Beatriz P.P. Oliveira[2], J.A. Vázquez[5], Isabel C.F.R. Ferreira[1]
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Tomato (*Lycopersicon esculentum* Mill.) is the second most important vegetable crop worldwide and a rich source of hydrophilic (*H*) and lipophilic (*L*) antioxidants. The *H* fraction is constituted mainly by ascorbic acid and soluble phenolic compounds, while the *L* fraction contains carotenoids (mostly lycopene), tocopherols, sterols and lipophilic phenolics [1,2]. To obtain these antioxidants it is necessary to follow appropriate extraction methods and processing conditions. In this regard, this study aimed at determining the optimal extraction conditions for *H* and *L* antioxidants from a tomato surplus. A 5-level full factorial design with 4 factors (extraction time (*t*, 0-20 min), temperature (*T*, 60-180 °C), ethanol percentage (*Et*, 0-100%) and solid/liquid ratio (*S/L*, 5–45 g/L)) was implemented and the response surface methodology used for analysis. Extractions were carried out in a Biotage Initiator Microwave apparatus. The concentration-time response methods of crocin and β-carotene bleaching were applied (using 96-well microplates), since they are suitable *in vitro* assays to evaluate the antioxidant activity of *H* and *L* matrices, respectively [3]. Measurements were carried out at intervals of 3, 5 and 10 min (initiation, propagation and asymptotic phases), during a time frame of 200 min. The parameters P_m (maximum protected substrate) and V_m (amount of protected substrate per g of extract) and the so called IC_{50} were used to quantify the response. The optimum extraction conditions were as follows: *t*=2.25 min, *T*=149.2 °C, *Et*=99.1 % and *S/L*=45.0 g/L for *H* antioxidants; and *t*=15.4 min, *T*=60.0 °C, *Et*=33.0 % and *S/L*=15.0 g/L for *L* antioxidants. The proposed model was validated based on the high values of the adjusted coefficient of determination (R^2_{adj}>0.91) and on the non-significant differences between predicted and experimental values. It was also found that the antioxidant capacity of the *H* fraction was much higher than the *L* one.

References

[1] Pinela, J.; Barros, L.; Carvalho, A.M.; Ferreira, I.C.F.R., Food Chem Toxicol 2012, 50, 829-834
[2] Barros, L.; Dueñas, M.; Pinela, J.; Carvalho, A.M.; Santos Buelga, C.; Ferreira, I.C.F.R., Plant Food Hum Nutr 2012, 67, 229-234
[3] Prieto, M.A.; García, M.A., Vázquez, J.A.; Anders, Y.; Curran, T.P., Food Res Int 2013, 53, 836-846

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