XXIV Encontro Luso Galego de

QUÍMICA

21-23 novembro de 2018

Porto - Portugal

LIVRO DE RESUMOS

SOCIEDADE PORTUGUESA DE QUÍMICA

U.PORTO
FACULDADE DE CIÊNCIAS
UNIVERSIDADE DO PORTO

Colegio Oficial de
Químicos de Galicia

XXIV Encontro Luso Galego de QUÍMICA

21 A 23NOVEMBRO 2018

PORTO - PORTUGAL

SOCIEDADE PORTUGUESA DE QUÍMICA

U.PORTO
FACULDADE DE CIÊNCIAS
UNIVERSIDADE DO PORTO

Colegio Oficial de
Químicos de Galicia

TÍTULO
Livro de Resumos do XXIV Encontro Luso-Galego de Química

AUTORES
Victor Freitas, Joana Oliveira

EDIÇÃO
Sociedade Portuguesa de Química
Av. Da República, 45 – 3º Esq
1050-187 Lisboa – Portugal

DATA
Novembro de 2018

TIRAGEM
500 Exemplares

ISBN
978-989-8124-24-1

DESIGN GRÁFICO
Joana Macedo

CATALOGAÇÃO RECOMENDADA
Livro de Resumos do XXIV Encontro Luso-Galego de Química
Faculdade de Ciências, U. Porto, 2018 – 500 p.
ISBN 978-989-8124-24-1
Química – Congressos

Este livro de atas foi produzido a partir dos trabalhos submetidos diretamente pelos autores. Apenas foram introduzidas pequenas alterações de edição, o que não alterou o conteúdo científico. A versão final online foi estabelecida para o XXIV Encontro Luso-Galego de Química, de acordo com o modelo publicado. Os autores são responsáveis pelo conteúdo científico dos seus trabalhos.

ÍNDICE

PROGRAMA CIENTÍFICO

21 NOVEMBRO 2018 | QUARTA-FEIRA				
9:00 - 11:00	**ENTREGA DA DOCUMENTAÇÃO**			
11:00 - 11:30	**SESSÃO DE ABERTURA**			
11:30 - 12:30	**PLENÁRIA DE ABERTURA** **Auditório Ferreira da Silva (AFS)** Stéphane Quideau			
12:30 - 14:00	**ALMOÇO**			
14:00 - 15:00	QAMA 1	QO 1	QA 1	QAMB 1
	QAMA 2	QO 2	QA 2	QAMB 2
	QAMA 3	QO 3	QA 3	QAMB 3
	QAMA 4	QO 4	QSOC 1	QAMB 4
Pausa (5 min)				
15:05 - 16:05	QAMA 5	QO 5	QA 5	QAMB 5
	QAMA 6	QO 6	QA 6	QAMB 6
	QAMA 7	QO 7	QA 7	QAMB 7
	QAMA 8	QO 8	QA 8	QAMB 8
16:05 - 17:00	**PAUSA CAFÉ / SESSÃO DE POSTERS**			
17:00 - 17:45	**PLENÁRIA 1 (AFS)** Tomás Cordero Alcántara			
17:45 - 18:30	QAMA 9	QO 9	CAT 1	QAMB 9
	QAMA 10	QO 10	CAT 2	QAMB 10
	QAMA 11	QO 11	CAT 3	QAMB 11
Pausa (5 min)				
19:00 - 19:45	QAMA 12	SQ 1	CAT 4	QAMB 12
	QAMA 13	QP 1	CAT 5	QAMB 13
	QAMA 14	CAT 10	CAT 6	QAMB 14
19:45	**PORTO DE HONRA**			

PROGRAMA CIENTÍFICO

22 NOVEMBRO 2018 | QUINTA-FEIRA			
9:00 - 10:00	QAMA 15	QS 1	QT 1
	QAMA 16	QS 2	QT 2
	QAMA 17	QS 3	QT 3
	QAMA 18	QS 4	QT 4
Pausa (5 min)			
10:05 - 11:15	QAMA 19	CAT 7	QS 5
	QAMA 20	CAT 8	QS 6
	QAMA 21	CAT 9	QS 7
	QAMA 22	CAT 11	QS 8
	QAMA 23	QS 56	QS 9
11:15-11:45	**PAUSA CAFÉ/ SESSÃO DE POSTERS**		
11:45-12:30	**PLENÁRIA 2 (AFS)** Carlos Lodeiro Espinõ		
12:30-14:00	**ALMOÇO**		
14:00 - 15:00	QAMA 24	CAT 12	QAMB 15
	QAMA 25	CAT 13	QAMB 16
	QAMA 26	CAT 14	QAMB 17
	QAMA 27	QA4	QAMB 18
Pausa (5 min)			
15:05 - 16:05	QS 10	QSOC 2	QAMB 19
	QS 11	QA 9	QAMB 20
	QS 12	QA 10	QAMB 21
	QS 13	QA 11	QAMB 22
16:05-17:00	**PAUSA CAFÉ / SESSÃO DE POSTERS**		
17:00-17:45	**PLENÁRIA 3 (AFS)** Pilar Goya Laza		
17:45-19:00	QS 14	QA 12	QAMB 23
	QS 15	QA 13	QAMB 24
	QS 16	EEQ 1	QAMB 25
	QS 17	EEQ 2	QSUS 7
20:00	**JANTAR DO ENCONTRO**		

PROGRAMA CIENTÍFICO

23 NOVEMBRO 2018 | SEXTA-FEIRA				
9:00 - 10:00	QAMA 28	QS 18	QF 1	
	QAMA 29	QS 19	QF 2	
	QAMA 30	QS 20	QF 3	
	QAMA 31	QS 21	QF 4	
Pausa (5 min)				
10:05 - 11:05	BB 1	QS 22	QF 5	
	BB 2	QS 23	QF 6	
	BB 3	QS 24	QF 7	
	BB 4	QS 25	QF 8	
11:05-11:45	**PAUSA CAFÉ/ SESSÃO DE POSTERS**			
11:45-12:30	**PLENÁRIA 4 (AFS)** Manuel António Coimbra (AFS)			
12:30-14:00	**ALMOÇO**			
14:00-15:30	QAMA 32	BB 5	NN 1	QSUS 1
	QAMA 33	BB 6	NN 2	QSUS 2
	QAMA 34	BB 7	NN 3	QSUS 3
	QAMA 35	BB 8	NN 4	QSUS 4
	QI 1	QAMA 36	NN 5	BB 9
	QI 2	QAMA 37	NN 6	QSUS 5
15:30-16:00	**PAUSA CAFÉ/ SESSÃO DE POSTERS**			
16:00-17:30	QI 3	QAMA 38	NN 7	QSUS 6
	QI 4	QAMA 39	NN 8	QIE 1
	QI 5	BB 10	NN 9	QIE 2
	QI 6	BB 11	NN 10	QIE 3
	QI 7	BB 12	NN 11	QIE 4
	QI 8	BB 13	NN 12	QI9
17:30	**SESSÃO DE ENCERRAMENTO**			

COMUNICAÇÕES ORAIS

21 NOVEMBRO 2018 - Quarta-feira

17:45 - 18:30

SALA 4 FC6 (1.42)

QO 9	**Novel porphyrin-flavone conjugates: synthesis and photophysical characterization,** Mariana Mesquita
QO 10	**New routes for the synthesis of marine xanthones with antimicrobial activity,** Daniela Loureiro
QO 11	**Bioguided study in the search for natural antifungal components in the Brazilian Biomas,** Marcelo Silva

19:00 - 19:45

SALA 1 Auditório Ferreira da Silva

QAMA 12	**Recuperação otimizada de antocianinas de Prunus spinosa L. e Ficus carica L. para aplicação como corante alimentar,** Carla Pereira
QAMA 13	**Optimized Acetonitrile Based-Extraction for Determination of Polycyclic Aromatic Hydrocarbons in Cooked Muscle Foods,** Marta da Silva
QAMA 14	**In-house validation method for the determination of 24 pharmaceuticals in clams using QuEChERS-LC-MS/MS ,** Cristina Almeida

SALA 2 Auditório FC6 (0.29)

QAMB 12	**Viability of the conversion of leachate effluents, from a mechanical biological treatment plant for municipal solid waste, to fertilizers,** Jonathan Cardoso
QAMB 13	**Simultaneous removal of sulfamethoxazole and methyl paraben by electro-Fenton treatment,** Antón Puga Pazo
QAMB 14	**Monitoring of several chiral drugs in the Douro river estuary by LC-MS/MS,** Maria Coelho

SALA 3 FC6 (1.37)

CAT 4	**Development of heterogeneous nanostructured catalysts for biodisel production,** Catarina Lino
CAT 5	**Waste oils valorization through biodiesel synthesis using [HMIM]HSO4 ionic liquid as catalyst,** Paulo de Brito
CAT 6	**Kinetic study of the esterification process catalyzed by ionic liquids for fatty acid methyl esters production,** Cristiana Meireles

SALA 4 FC6 (1.42)

SQ 1	**Evaluación de la Exposición a Contaminantes Químicos en el Tratamiento de Residuos Vegetales,** Eugénio Muñoz Camacho
QP 1	**Thermal properties and molecular interactions of alginate/gelatin hydrogel microparticles,** Nadezhda Pilipenko
CAT 10	**Redução de bromato em água na presença de catalisadores metálicos suportados em nanotubos de carbono modificados,** Ólivia Salom Soares

Waste oils valorization through biodiesel synthesis using [HMIM] HSO_4 ionic liquid as catalyst

Paulo Brito[1,*], **Higgor Góes**[1], **Lisandra Lima**[2], **Ana Queiroz**[1], **António Ribeiro**[1]
[1] CIMO – Mountain Research Center, Polytechnic Institute of Bragança, Campus de Santa Apolónia, 5300-253 Bragança, Portugal; [2] Dept. Chemical Engineering, Universidade Tecnológica Federal do Paraná, Campus Londrina, Londrina-PR, Brasil - *paulo@ipb.pt

Historically, economic growth was always dependent on energy generation, causing pressure on fossil energy sources. In this context, alternative renewable energy sources have been extensively studied. Hence, biodiesel, a biofuel obtained from renewable biomass for internal combustion engines or energy generation, exhibits potential to replace partially or totally fossil fuels. Biodiesel is chemically composed of FAME (fatty acid methyl esters), that can be obtained from the chemical reaction of triglycerides with an alcohol, in the presence of a catalyst. Different raw materials can be used to produce biodiesel, such as edible vegetable oils (soybean oil, rapeseed oil) or inedible oils (jatropha oil, castor oil), animal fats, waste cooking oils and oils extracted from algae [1]. Acid and basic catalysts are applied to increase the reaction rate. For transesterification reactions, basic catalysts (NaOH or KOH) are the most commonly used. Alternative options for these catalysts are ionic liquids (ILs), which are being studied since they enable a more environmentally sustainable biodiesel production process. Such compounds have potential for recyclability, high catalytic activity, simple operating conditions and high conversion rates with short reaction times [2].

The objective of this work is to study the influence of applying 1-methylimidazolium hydrogen sulfate [HMIM]HSO_4 IL on the catalysis of esterification/transesterification reactions of a highly acidic waste vegetable oil (WVO), in order to assess the viability of the use of acidic imidazolium based ILs as catalysts in biodiesel production processes. Therefore, samples of simulated oils with variable acidity were used as raw material. These samples were prepared by the incorporation of different contents of oleic acid (tech. 90%) in a previously qualitatively and quantitatively characterized WVO. For the reaction, methanol was used and IL [HMIMHSO_4 was applied as the catalyst. An experimental design based on a total factorial was generated with three parameters at two levels (2^3) in duplicate: incorporated oleic acid, methanol/simulated oil molar ratio, and reaction time. Table 1 describes the three parameters chosen, the code applied, and the two levels used. Two responses were evaluated: the conversion of the simulated oil, measured according to the procedure described in the European Standard EN14104/2008, and the produced biodiesel FAME content, estimated by GC-FID, according to the procedure established in the European Standard EN 14103/2003. The fixed reaction parameters were: temperature, 90°C, and catalyst charge, 10% wt, and the statistical analysis was carried out with Design Expert 11 software.

The influence of the factors for the conversion response was C>B>A, and the optimal conditions were: 20% (factor A), 1:40 (B), and 8h (C), reaching a maximum conversion of 96.6%. On the other hand, regarding the FAME content response, the influence of factors was A>C>B, and the optimal conditions were, 40% (A), 1:20 (B), and 8h (C), for a maximum FAME content of 36.5%. It is concluded that the studied IL promoted mainly the esterification of the free fatty acids in the WVO samples, and apparently had little influence in promoting transesterification reactions.

Parameter	Code	-1	1
Oleic Acid incorporated (%)	A	20	40
Molar ratio oil/methanol (mol/mol)	B	1:20	1:40
Time (h)	C	4	8

Table 1. Levels applied in the experimental design.

REFERENCES:
[1] F. Roman, Biodiesel production through esterification applying ionic liquids as catalysts. MSc. Thesis, Polytechnic Institute of Bragança, Portugal, 2018.
[2] Z. Ishak, N. Sairi, Y. Alias, M. Aroua, R. Yusoff, Catalysis Reviews. Science and Engineering, 59 (2017) 44.