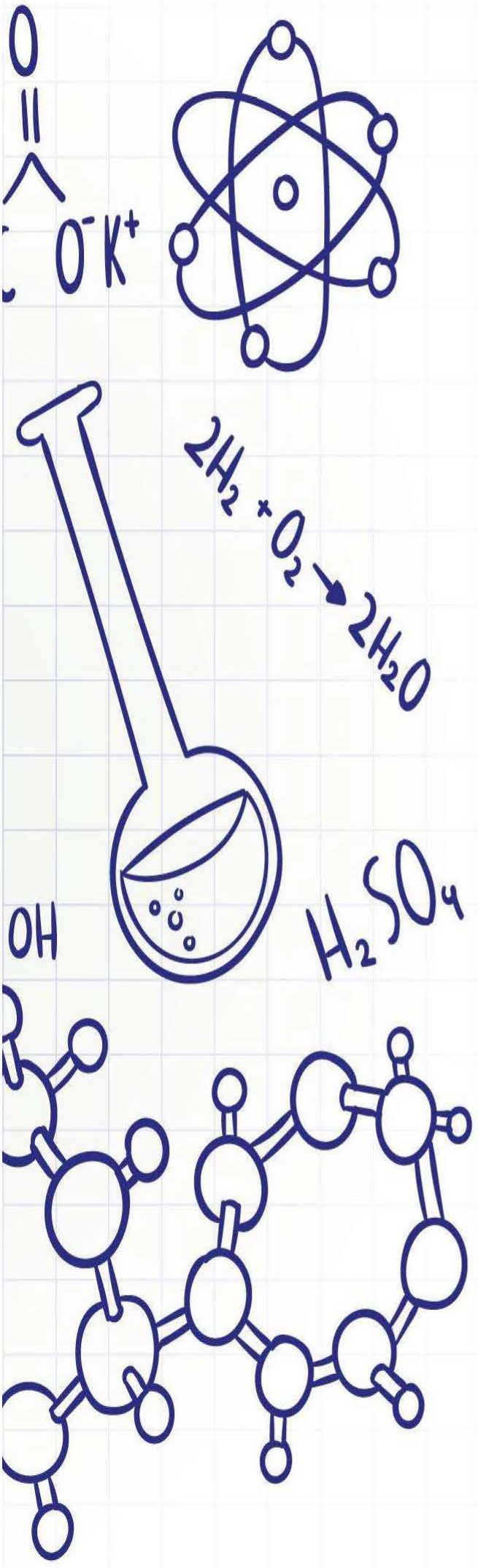

XXI ENCONTRO GALEGO PORTUGUÉS DE QUÍMICA

Pontevedra (España)

2015

XXI ENCONTRO GALEGO-PORTUGUÉS DE QUÍMICA

18 al 20 de noviembre de 2015

Pazo da Cultura de Pontevedra

Galicia (España)

Colegio Oficial de Químicos de Galicia

Sociedade Portuguesa de Química

Asociación de Químicos de Galicia

XXI ENCONTRO GALEGO-PORTUGUÉS DE QUÍMICA
Noviembre 2015

Coordinador Editorial
Antonio Macho Senra

Edita
Colegio Oficial de Químicos de Galicia
Rúa Urzaiz, 1 – 2º dcha.
36201 Vigo (Pontevedra)
www.colquiga.org

Portada
Imagen: Designed by Freepik.com

Tirada
250 Ejemplares

Imprime
Diputación Provincial de Pontevedra

Depósito Legal
VG 683-2015

ISBN
978-84-608-3441-0

Este libro de comunicaciones y conferencias, presentadas en el XXI Encontro Galego-Portugués de Química, ha sido editado con el patrocinio de la Diputación Provincial de Pontevedra.

Catalogación recomendada
Libro de resúmenes del XXI Encontro Galego-Portugués de Química
Pazo da Cultura de Pontevedra (España) 2015

Preparative Separation of Multicomponent Mixtures by Simulated Moving Bed Liquid Chromatography

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Direct racemic resolution of enantiomers by means of liquid chromatography using chiral stationary phases is nowadays a very popular technique. This popularity is mainly due to development of new chiral stationary phases and also by exploring and developing new and more efficient modes of operation. The use of chiral liquid chromatography through the simulated moving bed (SMB) technology has gained a renewed interest as an alternative technique for the production of fine chemicals and pharmaceuticals.

The classic SMB process is a continuous process to separate binary (or pseudo-binary) mixtures or to recover one single component from a multicomponent mixture. Several modified SMB processes have been introduced to separate multicomponent mixtures. Among then, the cascade SMB, the intermittent SMB, the JO processes and other complex multi-zone SMB related techniques, are often applied to the separation of multicomponent mixtures. The JO technology allows the separation of ternary mixtures through a cyclic process constituted by two discrete steps [1].

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Nadolol is a pharmaceutical drug marketed as a mixture of four stereoisomers, used to treat cardiovascular diseases. However, its prescription is also related with some severe risks such as heart failure. It is well known that pure enantiomer separation is important to control chiral drugs safety. Recently, our research group reported the pseudo-binary separation of nadolol by SMB chromatography [2]. Using the classic SMB mode of operation, the complete separation of nadolol stereoisomers was achieved using Chiralpak AD chiral stationary phase (CSP). The more retained stereoisomer was collected 100% pure in the extract and a mixture of the other three stereoisomers was collected in the raffinate. In this work, we will present different strategies for multicomponent separation, using different solvent compositions, other CSP and SMB related techniques. Namely, (a) The use of Chiralpak IA, that comparing to AD CSP, allows the use of a wider range of solvents and therefore better separation performances; (b) The use of the JO process to achieve a final ternary separation, using the mixture of the three stereoisomers that co-eluted in the raffinate in the separation previously referred and (c) The separation of the two pairs of nadolol enantiomers using an achiral C18 material, followed by two parallel classic SMB binary enantioseparation processes.

Acknowledgements
Financial support by the Portuguese R&D foundation FCT (Fundação para a Ciência e a Tecnologia) and European Community through FEDER (project PTDC/EQU-EQU/119025/2010) is gratefully acknowledged. This work was co-financed by FCT/MEC and FEDER under Program PT2020 (Project UID/EQU/50020/2013) and by QREN, ON2 and FEDER (Project NORTE-07-0162-FEDER-000050).

References

[1] V.G. Mata and A.E. Rodrigues, J. Chromatogr. A **2001**, 939, 23-40.
[2] Ribeiro, A.E.; Rodrigues A.E.; Pais, L.S.; *Chirality* **2013**, *25*, 197-205.