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FABI

INVITATION

to the public defense of the doctoral dissertation of

Katrijn DE KLERCK

'Chiral separations on polysaccharide-based stationary phases in supercritical fluid chromatography'

To obtain the academic degree of
'Doctor in Pharmaceutical Sciences'

Academic year 2013-2014

Tuesday 1 July 2014 - 17:00

VUB, Laarbeeklaan 103, 1090 Jette
Auditorium Brouwer (Building A)

Summary of the dissertation

The production and commercialization of medicines with a chiral active product are subject to very strict regulations. Chiral separation methods are therefore indispensable to ensure the safety of this type of medicines. In the continuous search of the pharmaceutical industry for faster, more efficient and environment friendlier techniques, the interest in supercritical fluid chromatography (SFC) increased. Undoubtedly, the most successful, and therefore also most frequently used, chiral selectors are the polysaccharide-derivatives.

In this work, the enantioselectivity of different polysaccharide-based chiral stationary phases is evaluated using SFC as separation technique. From this information, chromatographic conditions are selected to define a screening step. This screening step allows finding appropriate separation conditions for a very broad range of active chiral ingredients. Afterwards, the focus was set on the definition of optimization steps, allowing optimizing separations to the desired result. With the research results, obtained in the context of the screening – and optimization experiments, a separation strategy was developed, enabling researchers to develop SFC chiral separation methods in a fast and efficient manner.

Using the data from the previous research, the potential of chemometric techniques to select complementary chromatographic systems, was assessed. In addition, the applicability of immobilized polysaccharide-based stationary phases was investigated and a comparison was made between results obtained on 3 µm and 5 µm particle chiral stationary phases. Summarized, in this thesis, different aspects of chiral separations in SFC were investigated, with an emphasis on the practical applicability of this technique.

Curriculum Vitae

Katrijn De Klerck was born on June 17th 1987 in Jette. In June 2010, she obtained the degree of 'Master in Drug Development-Pharmacist' with great distinction at the Vrije Universiteit Brussel. She defended her master thesis titled 'High-pressure liquid chromatography of poliovirus proteins - separation based on hydrophobic interaction chromatography' under the supervision of Prof. Y. Vander Heyden. In September 2010, she started her doctoral research at the department of Analytical Chemistry and Pharmaceutical Technology (FABI) under the supervision of Prof. Y. Vander Heyden and Prof. D. Mangelings.

In the context of her doctoral research on the 'Evaluation of the enantioselectivity of chiral polysaccharide-based systems in supercritical fluid chromatography', Katrijn published seven scientific papers as first author and contributed to three others as co-author, which were all published in peer-reviewed international journals. Two more papers are currently under review. She also presented nine posters and gave three oral presentations at national and international symposia. In 2012, she was nominated for 'Best poster presentation' at the 12th 'International Symposium on Hyphenated Techniques in Chromatography and Hyphenated Chromatographic Analyzers (HTC-12)' in Bruges.

On 1 April 2014, Katrijn started working at the Federal Agency of Drugs and Health Products as Inspector of Good Manufacturing Practice (GMP).