

Study of retention mechanisms and peak distortion in Supercritical fluid chromatography from analytical to semi-preparative scale

Master thesis at AstraZeneca, Mölndal

Background

Thousands of compounds are synthesised in pharmaceutical industry every year. These compounds can lead to life saving future medicines. Purification of these compounds is an important step before evaluating their potential against diseases. However, purification of these newly synthesised compounds is challenging due to highly diverse chemical structures, complex impurities and limited information about sensitivity of the compounds towards certain pH, temperature and/or light. Therefore, research and development of new analytical chemistry methods is of utmost importance to maintain a high throughput purification process.

Objectives

The focus of study is to understand separation mechanisms at analytical as well as preparative-scale supercritical fluid chromatography. The study may include testing various stationary phases and mobile phase compositions, investigating peak broadening, peak distortions and retention mechanisms.

- Literature review
- Development of new SFC methods at analytical scale
- Scale-up to preparative SFC
- Understanding band broadening and peak distortion in SFC
- Processing of experimental data
- Reporting

Possible individual development

- Understanding of chromatography and various parameters
- Experience in the development chromatographic methods
- Practical lab skills at state-of-the-art labs at AstraZeneca
- Developing a problem-solving mind-set
- Developing scientific communication skills
- Potential to publish and present work internally and externally

Additional information

Duration: 20/40 weeks (30/60 ECTS). The research work will be performed at Separation Science Laboratory, AstraZeneca, Mölndal.

The ideal candidate has a minimum of 5 years of university education in the field of chemistry, chemical engineering or similar. The candidate is required to be fluent in English.

Contacts

Master thesis will be performed under supervision of Dr. Hafiz Abdul-Azeem, Sr. Scientist, AstraZeneca and Prof Teodora Retegan Vollmer, Head of Nuclear Chemistry, Chalmers University of Technology. Please contact for more information at hafiz.abdul-azeem@astrazeneca.com.