

Nuclear magnetic resonance studies towards shift reagents for chiral sulfite derivatives

Summary

Nuclear magnetic resonance (NMR) is a powerful tool to differentiate between diastereomeric pairs of compounds. The idea behind NMR shift reagents is for chiral reagents to either react or give supramolecular complexes with enantiomers of substances that would then yield diastereomers and their chemical shifts would be different in NMR. In this project, we pursue to find NMR shift reagents for chiral sulfite compounds.

Research field:	Chemistry and Biotechnology
Supervisor:	Jasper Adamson
Availability:	This position is available.
Offered by:	School of Science National Institute Of Chemical Physics And Biophysics
Application deadline:	Applications are accepted between June 01, 2020 00:00 and July 03, 2020 23:59 (Europe/Zurich)

Description

Nuclear magnetic resonance (NMR) is a powerful tool to differentiate between diastereomeric pairs of compounds. The idea behind NMR shift reagents is for chiral reagents to either react or give supramolecular complexes with enantiomers of substances that would then yield diastereomers and their chemical shifts would be different in NMR. In this project, we pursue to find NMR shift reagents for chiral sulfite compounds. We use NMR as a technique to understand the weak supramolecular interactions between the sulfites and NMR shift reagents, such as TADDOLs, R-BINOL and so forth and will derive a series of association constants between both hands of the sulfite compounds and the shift reagents by NMR titrations. The project further allows to learn and apply variable temperature and 2D NMR techniques. The project will be undertaken in collaboration with Prof. Victor Borovkov.

Responsibilities and tasks:

- learning about NMR shift reagents
- performing NMR measurements for shift reagents and the sulfites
- suggesting new shift reagents based on the results gathered
- summarizing results in research papers

Qualifications

Master's degree in Organic Chemistry, solution NMR or Supramolecular Sciences

The applicants should fulfill the following requirements:

- The applicant should hold or be in the process of defending a Master's degree in Organic Chemistry or NMR with an understanding of Supramolecular Sciences.
- The applicant should be fluent in written and spoken English.
- Personal qualities, such as punctuality, conscientiousness and motivation, are essential for embarking upon the PhD degree.



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