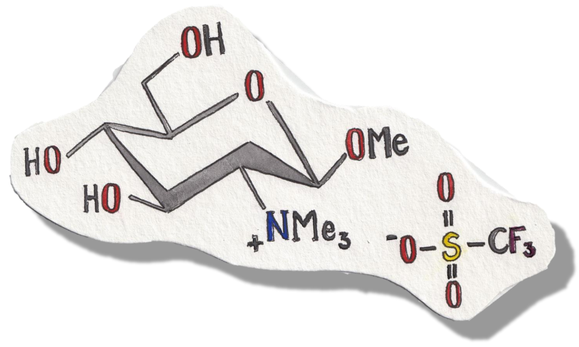
Universität Rostock

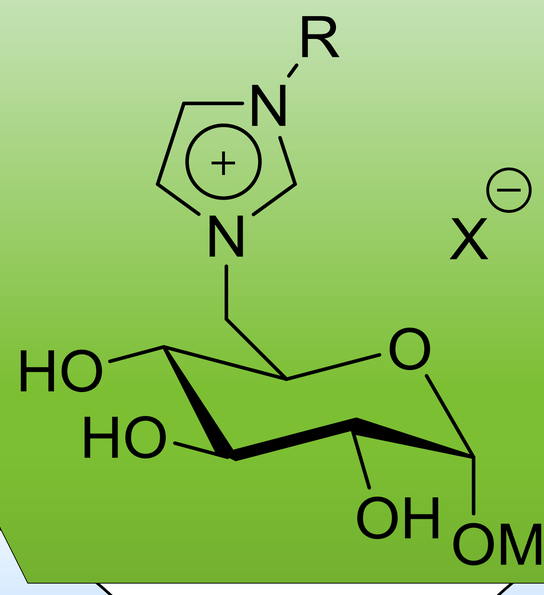
Traditio et Innovatio



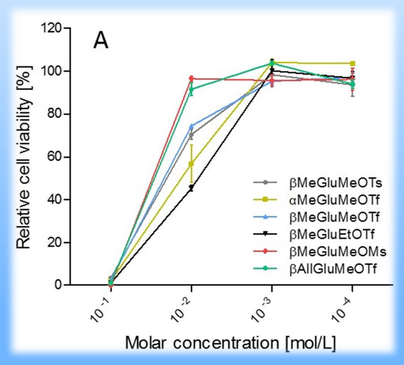
Junior Research Group
Carbohydrate Chemistry - CHILs

Ionic Liquids have become a widely known class of chemicals since their discovery. Defined as salts with melting points below 100°C, ionic liquids exhibit many useful properties like low vapor pressure, high thermal stability and exceptional dissolution ability. Commonly used cations for ILs are imidazolium, pyridinium or tetraalkylammonium based, while the anions are often weakly coordinating anions like BF_4, NTf_2 or OTf.
Many sub-classes of ILs have been developed since then. Some examples are the room temperature ILs (RTILs), which are useful as solvents, the polymerized ionic liquids (PILs), which function as charged polymers and the chiral ILs (CILs), which can be used in asymmetric syntheses. In the case of chiral ionic liquids, an effective strategy is to create ILs from the natural chiral pool, including amino acids, terpenes and carbohydrates.
Our research group focuses on carbohydrate based chiral ionic liquids (CHILs) – a relatively unexplored class of ILs with great potential as green alternatives to common ionic liquids. Our goal is the development and fundamental understanding of new CHILs as well as to explore suitable applications.

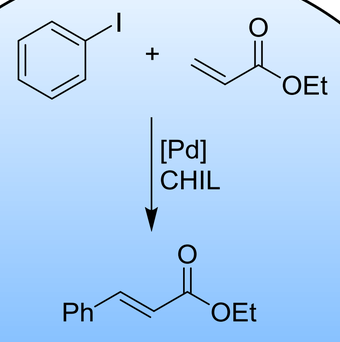
Carbohydrate based Ionic Liquids



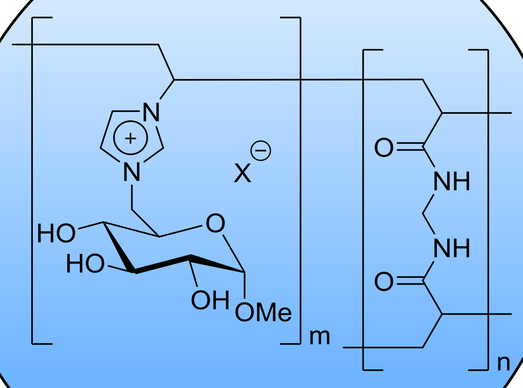
Biocompatibility



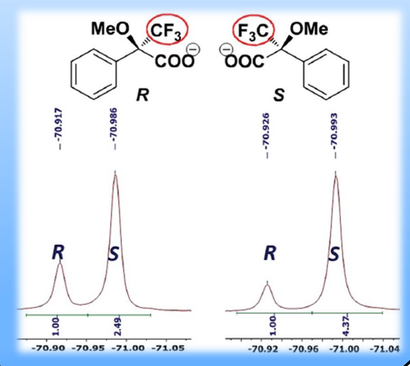
New Solvents in Organic Synthesis



Polymers



Enantiomeric Recognition by NMR



Structure Property Relationships

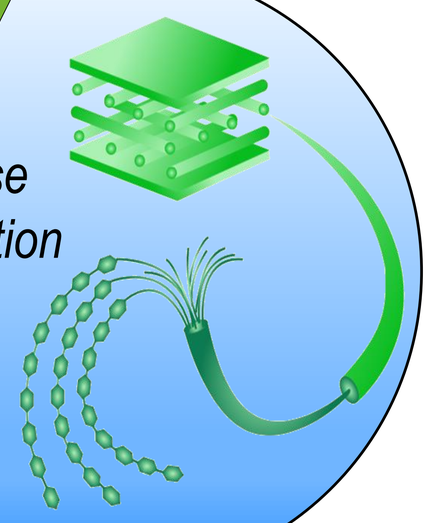
melting point:

NTf_2 < OTf < OMs < I < OTs

decomposition point:

I = OMs = OTs < OTf < NTf_2

Cellulose Dissolution



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