

## Chemistry Department

## New ionic chiral selectors

Manuela Pereira (PI) <sup>(1)</sup>  
Marco Gomes da Silva <sup>(2)</sup>  
Nuno Costa  
Ana Luisa Maria

(1) [manuela.pereira@fct.unl.pt](mailto:manuela.pereira@fct.unl.pt)  
(2) In collaboration



## Manuela Pereira

PhD in Organic Chemistry  
Assistant Professor in  
Organic Chemistry  
Scientific activity in  
asymmetric synthesis,  
radicals in organic  
synthesis, chiral ionic  
liquids.

## Objectives

The identification and quantification of the enantiomers of natural or synthetic chiral compounds is an important tool in e.g. the pharmaceutical, food or pesticide industries and in environmental control.

We intend to synthesize new chiral ionic liquids to be used as chiral selectors in solution and as stationary phases to chromatography techniques. These will be a fast and advanced new tool to be used in gas chromatography of complex mixtures to evaluate chiral compounds and its enantiomers with different polarity and volatility.

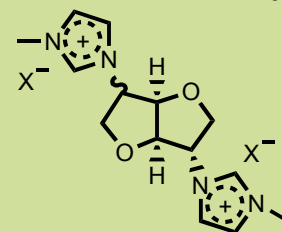
## Methodology

The aim of this proposal is to explore the properties and dual nature, polar and apolar, of chiral ionic liquids as stationary phases in gas-liquid chromatography. For that few chiral ionic liquids carbohydrate-based, derived from cyclodextrins, acyclic dextrins or others chiral carbohydrate structurally less complexes will be synthesized. They will be used in thermally stable stationary phases in GC with ability to the enantioseparation of chiral organic compounds with different polarities and to reduce elution temperature profiles and retention times.

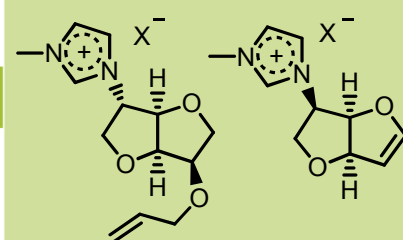
## Expected Results

These new chiral ionic liquids carbohydrate-based will likely lead to viable stationary phases that will exhibit enantioselectivity to a wider variety of chiral analytes allowing enantiomeric GC or GC×GC. While the retention characteristics of organic compounds provides important insight into the solvation properties of task-specific ionic liquids for routine chemical applications, these compounds may also exhibit unique separation characteristics that may make them valuable stationary phases for solute-specific separations .

### Dicationic chiral ionic liquid

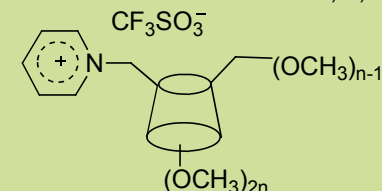
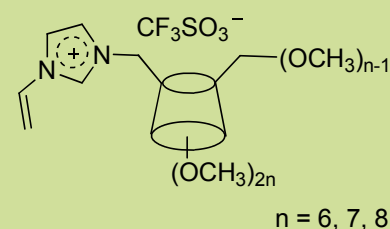


### Monocationic chiral ionic liquids

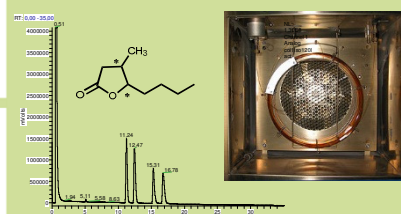


X = OTs, Cl, CF<sub>3</sub>SO<sub>3</sub><sup>-</sup>, (CF<sub>3</sub>SO<sub>2</sub>)<sub>2</sub>N<sup>-</sup>

### Cyclodextrin ionic liquids



### Whiskey lactone enantiomeric separation



Funding:

