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Enzymatic Conversion Of Mannosylerythritol Lipids In Natural Deep Eutectic Solvents

Introduction

- **Natural deep eutectic solvents (NADES) can be suitable media for biocatalytic reaction.**
- **NADES have a complex effect on the reaction parameters of biocatalysis, but the mechanism is not clearly understood.**
- **A case study to prove the feasibility of enzymatic functionalization in NADES and to investigate the possible effect of NADES on biocatalysis.**

Aim & Objective

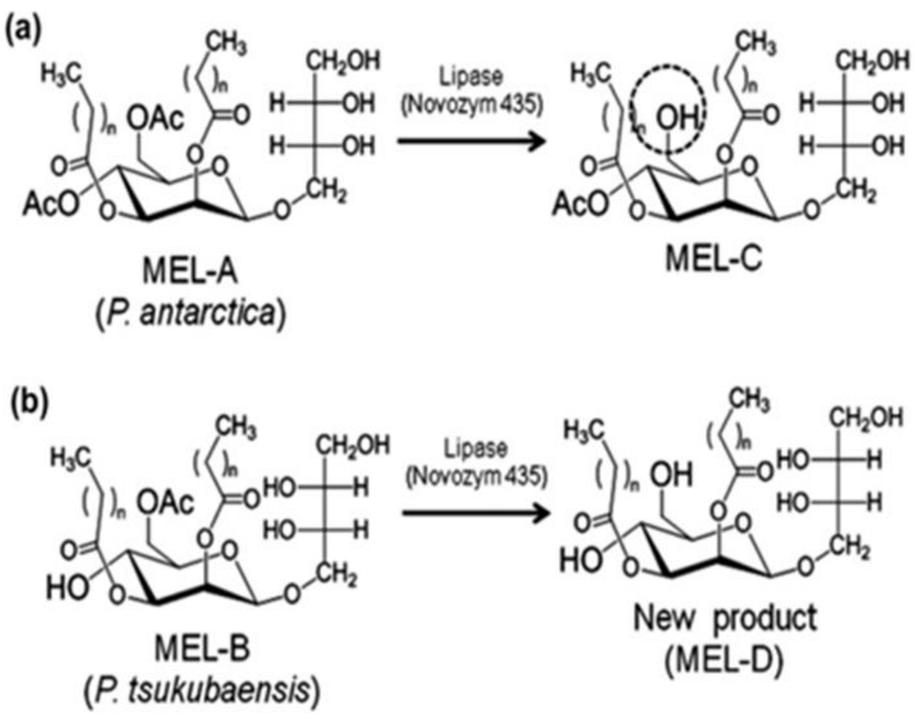
Aim: Differentiate the complex phenomena of solvation of reagents on enzyme activity and mass transfer to rationalize the changes of kinetic parameters in enzymatic modification of MELs in NADES

Objectives:

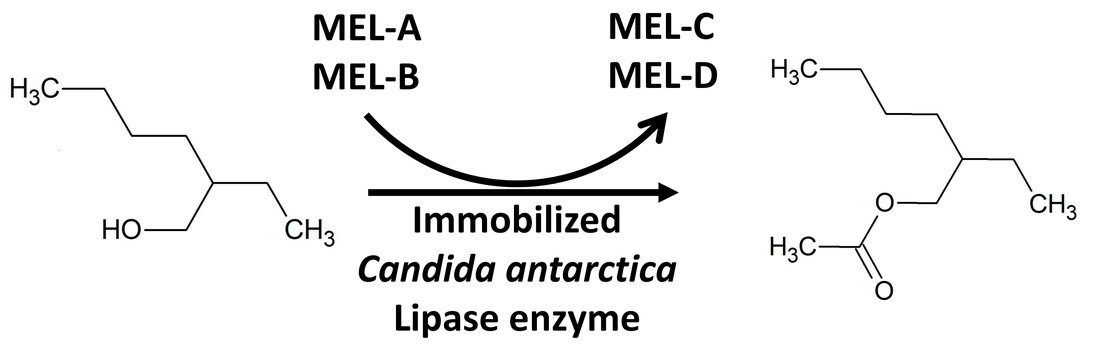
- **Proving the feasibility of MELs deacetylation in NADES media**
- **Describe the relationship between NADES properties and their effect on biocatalytic reactions**

Methods

Biocatalytic deacetylation of mannosylerythritol lipids (MELs):



Determination of reaction parameters:



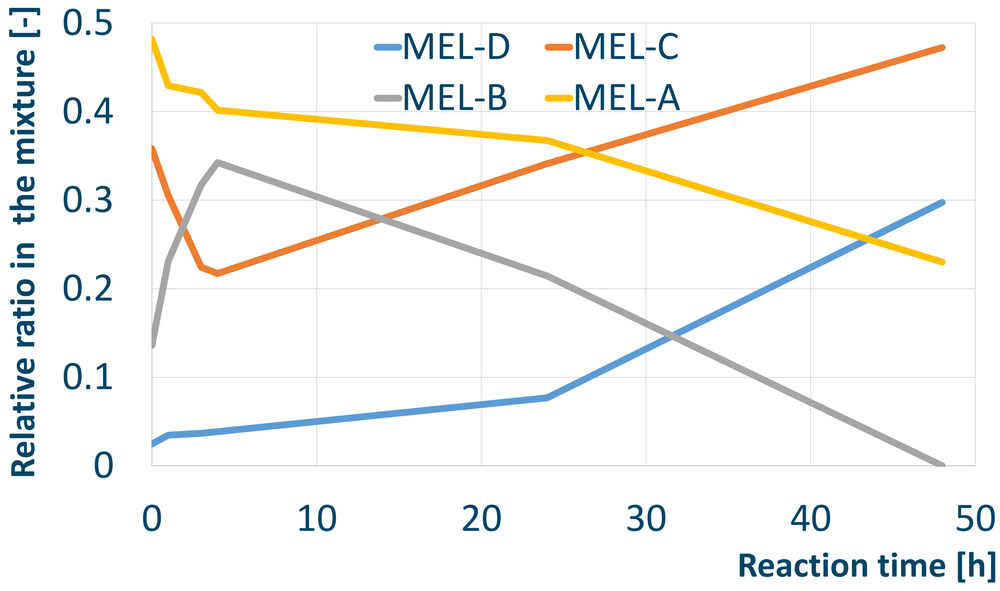
2-ethyl hexanol

2-ethylhexyl acetate

Results and discussion

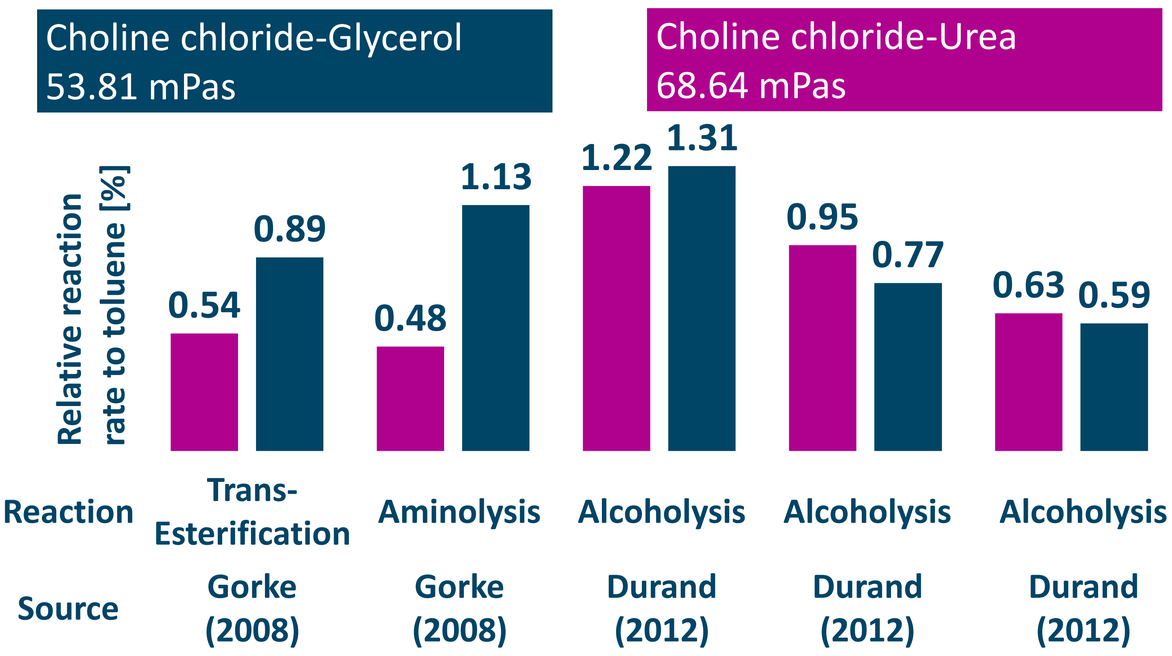
Deacetylation of MELs in NADES: proven feasibility

Choline chloride + ethylene glycol (2:1 molar ratio)

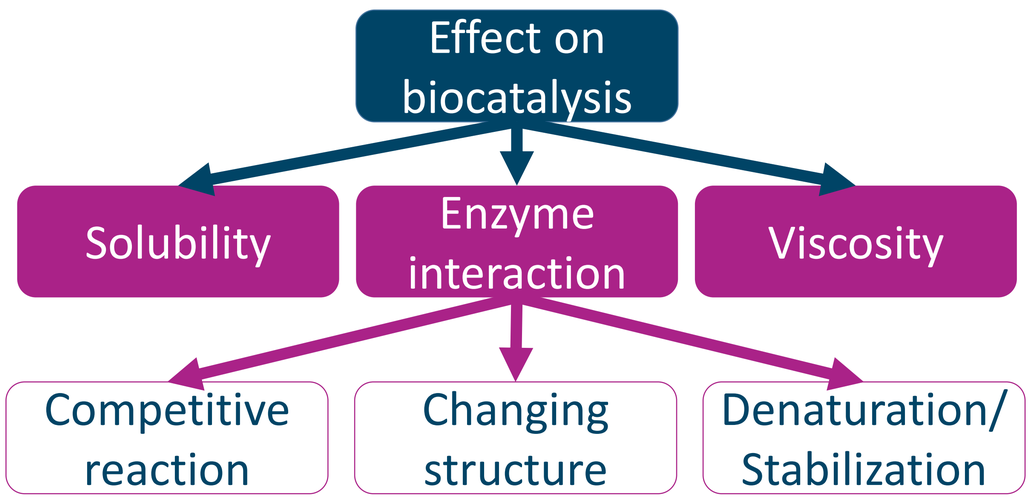


Relationship of viscosity and reaction rate: no clear relation

Reactions with immobilized *Candida antarctica* lipase



Proposed relationship between NADES and biocatalysis



Conclusion

- **Case study: the feasibility of the enzymatic functionalization of MELs in NADES was proven**
- **Framework for the relationship between the properties of NADES and biocatalysis is proposed**

References:

Gorke et al., 2008.
Goossens et al., 2016.
Durand et al., 2012.
Goossens and Wijnants, 2018

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Further information:
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