SCIENCESPRINGDAY

FCT FACULDADE DE CIÊNCIAS E TECNOLOGIA UNIVERSIDADE NOVA DE LISBOA

Chemistry Department

Sub-, Supercritical Biorefinery

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Objectives

Biomass and agro-industrial waste valorization using green solvents.

High added value compound production from yeast using HCW hydrolysates.

Biopolymer modification for biomedical applications using ionic liquids (IL).

Biodiesel production from algae/yeast oil and agro-industrial waste oil

Biocatalytic reduction of CO_2 to methanol

Enzymatic separation/fractionation of enantiomers for pharmaceutical application using scCO2/IL biphasic systems

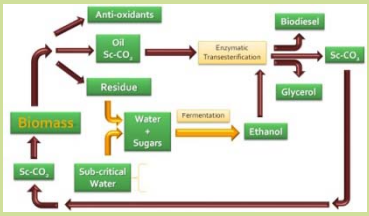
Methodology

ScCO2 technology is applied for the extraction of high added-value compounds from agro-industrial waste. Supercritical extraction is studied at lab and pilot scale.

Semi-continuous HCW hydrolysis is perform at high temperatures and pressures for the hydrolysis of ligno-cellulosic material in agro-industrial waste.

IL and $scCO_2$ are used for the plasticization of natural biopolymers

Enzymatic reactions are performed under scCO2 and in biphasic system IL/scCO2 for the reduction of CO_2 into methanol and for the selective transesterification of menthol enantiomers.



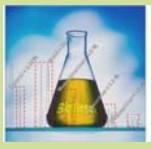
Expected Results

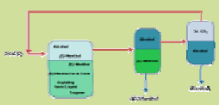
Results obtained for the scCO2 extraction at pilot scale will allow scale-up calculations for the implementation of an industrial process.

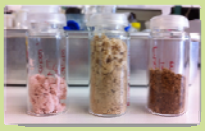
The characterization and application of the compounds obtained after HCW hydrolysis will be studied and their application for yeast growth evaluated.

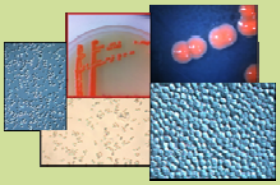
Plasticized biopolymers with IL technology will be obtained

The transesterification of menthol enantiomers will be optimized.









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