

# BOOK OF ABSTRACTS

February 2021  
15<sup>th</sup> - 16<sup>th</sup>



**COST Action GREENERING**  
**CA 18224**

Green Chemical Engineering Network  
towards upscaling sustainable processes

# 1<sup>st</sup>

# GREENERING

INTERNATIONAL  
CONFERENCE



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COSTA DA CAPARICA, PORTUGAL

15<sup>th</sup>-16<sup>th</sup> FEBRUARY 2021



SHARE  
Ideas to  
greener  
**OUR**  
world

1<sup>st</sup>

**GREENERING** INTERNATIONAL  
CONFERENCE

We invite **YOU**  
to join the conference  
and share your  
**GREEN** ideas with us!

Costa da Caparica, Portugal  
15<sup>th</sup> - 17<sup>th</sup> February 2021

**COST Action GREENERING  
CA 18224**  
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*Welcome address*

*The 1<sup>st</sup> Greenering International Conference is a joint organization between VALORIZA Research Centre, Polytechnic Institute of Portalegre, Portugal, HES-SO University of Applied Sciences and Arts Western Switzerland – School of Engineering and Architecture Fribourg (HEIA-FR) and Faculdade de Ciências e Tecnologia from Universidade Nova de Lisboa, framed in the Greenering COST Action. These 2-day conference, hosted by DES Solutio, will take place online, due to the pandemic situation, on the 15<sup>th</sup> and 16<sup>th</sup> February 2021.*

*The main objective of conference is to join academics, researchers, and companies in an international forum to promote industrial application of green chemistry and sustainable technologies, into industries, with environmental, innovation, economic and policy aspects in focus. Our intention is to consolidate a multidisciplinary network actively involved in green technologies and sustainable development to create an area of exchange between academic institution and companies, which are active in the field of “Green Chemistry”.*

*The success of the conference has been demonstrated by the more than 130 abstracts submitted for presentation and more than 150 registered participants, from 23 different countries. With 5 keynote lectures, 4 from which presented by industrial participants, this clearly demonstrated the interest of industry to the adoption of more sustainable processes. The conference has gathered interest not only from participants of the Greenering network but also from another relevant COST Action (CA18112) - Mechanochemistry for Sustainable Industry.*

*Thank you for helping us organizing such an interesting scientific meeting. We wish you a pleasure and prolific conference.*

*The Organizing Committee*

**Title:** The Book of Abstracts of the 1<sup>st</sup> GREENERING International Conference

**Publishes abstracts from the following fields:** Alternative solvents, Biofuels and Bioenergy, Cosmetics, Food technology, Pharmaceuticals, Raw materials, Waste treatment/valorization, and Green policies and innovation.

**Publishers:**

- VALORIZA Research Centre, Polytechnic Institute of Portalegre, Portugal,
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## ZETA POTENTIAL OF SOME HYDROXYCINNAMIC ACIDS

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Polyphenol acids are plant metabolites found in food. They contain a phenolic ring and at least one organic carboxylic acid function. Caffeic, chlorogenic, ferulic acids are some of the hydroxycinnamic acids. In food, hydroxycinnamic acids are found in the form of esters.  $\beta$ -glucan is a polysaccharide that belongs to the group of soluble fibres. Zeta potential is also called electrokinetic potential, which represents a physical property on the surface of a macromolecule. Also, zeta potential is defined as the potential at the distance of the shear surface. Knowing the zeta-potential allows predicting the long-term most stable behaviour of a macromolecule. Stability of a macromolecule depends on the zeta potential and the charge on the surface and the macromolecule. One of the aims of this work is to determine the zeta potential of hydroxycinnamic acids solutions,  $\beta$ -glucan solution and hydroxycinnamic acids and  $\beta$ -glucan model through different concentration ranges. The second aim is the prediction of the most stable behaviours of hydroxycinnamic acids and  $\beta$ -glucan models at different pH values. In addition, absorption spectra were recorded. Zeta potential of hydroxycinnamic acids and  $\beta$ -glucan model had shown in acidic medium positive values and alkali medium negative values. The highest zeta potential value of hydroxycinnamic acids and  $\beta$ -glucan model had reached in pH 10. According to the stability criteria, hydroxycinnamic acids and  $\beta$ -glucan model had shown the most stable behaviour at pH 10. The change of pH value had a great influence on the chemical structure and the zeta potential value of analyzed models.

*Keywords: Zeta potential, Caffeic acid, Chlorogenic acid,  $\beta$ -glucan*

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*Personal ZOOM link:*

<https://us04web.zoom.us/j/4654150818?pwd=QmhlSHA3YldCTS9aOW9veikwTVFaQT09>

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