

EMEC 1 ∞

CHEMISTRY TOWARDS AN INFINITE ENVIRONMENT

18th European Meeting on Environmental Chemistry

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BOOK OF ABSTRACTS



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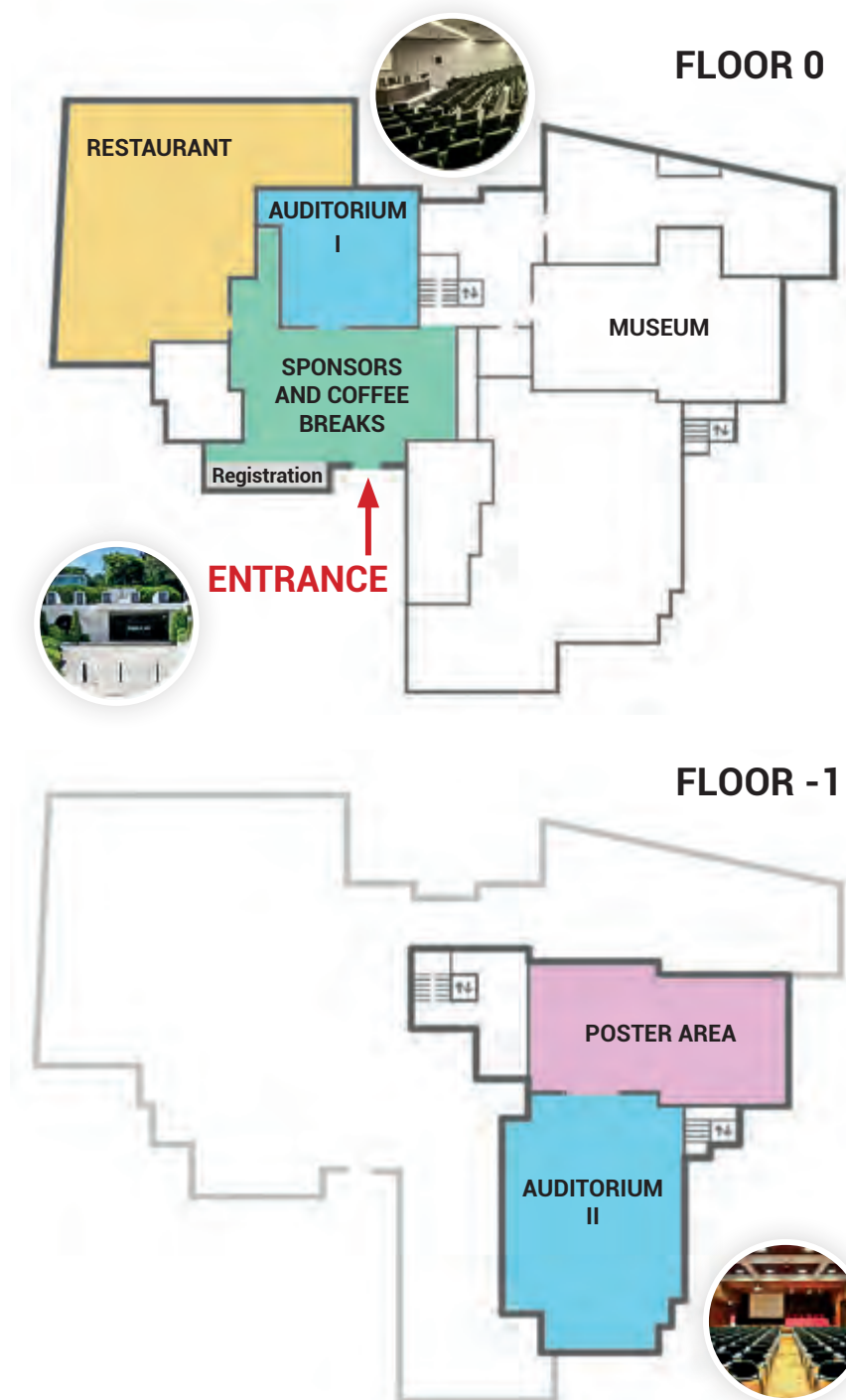


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Titulo

Book of Abstracts of the 18th European Meeting on Environmental Chemistry - EMEC18:
Chemistry Towards an Infinite Environment

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LEPABE Laboratory of Process Engineering, Environment, Biotechnology and Energy
LSRE-LCM Laboratory of Separation and Reaction Engineering - Laboratory of Catalysis and Materials
CEFT Transport Phenomena Research Center

are Research Units at the Department of Chemical Engineering,
Faculdade de Engenharia da Universidade do Porto (FEUP).

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Tunisian Olive Oils Geographical Origin Discrimination Using the Potentiometric Fingerprints Recorded by an Electronic Tongue

PP AgroFood #19

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The development of fast and cost-effective analytical techniques for EVOO authentication is a challenging task. Moreover, if a specific meteorological or geographical factor affects different geographical regions similarly, olive oils' geographical discrimination may be a hard task using conventional analytical techniques [1]. E-noses and/or voltammetric E-tongues have already been applied to assess olive oils' geographical origin, mainly to discriminate different countries or quite different regions of the same country [2].

In this work, we used an electronic tongue (E-tongue), with 40 lipid membrane sensors, to extract representative potentiometric fingerprints of Tunisian monovarietal olive oils that, in combination with linear discriminant analysis (LDA), could be used to classify olive oils according to the geographical origin. Aqueous ethanolic (80:20, v/v) extracts of different single-cultivar Tunisian olive oils were electrochemically analysed. According to the literature [3-6], these olive oil extracts are rich in polar compounds that deliver different overall potentiometric responses, which can then be used to evaluate the E-tongue performance for olive oils' geographical origin discrimination. The proposed E-tongue-LDA approach, based on the signal profiles of different sub-sets of sensors (selected with the simulated annealing meta-heuristic

algorithm) allowed the correct geographical origin classification of Tunisian olive oils produced from autochthonous Chemlali or Sahli cultivars (i.e., Kairouan, Sidi Bouzid and Sfax; or, Mahdia, Sousse and Kairouan; respectively). Indeed, predictive correct classifications of $92\pm7\%$ and $97\pm8\%$ (for repeated K-fold cross-validation) could be obtained for Chemlali or Sahli olive oils, pointing out the potential use of the E-tongue device for geographical origin identification of olive oils.

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