

BOOK OF ABSTRACTS



U. PORTO



16.ª EDIÇÃO

**ENCONTRO DE
INVESTIGAÇÃO
JOVEM
UNIVERSIDADE
DO PORTO**



**10.11.12
MAIO 2023**

REITORIA DA
UNIVERSIDADE
DO PORTO

U.PORTO



TÍTULO | *TITLE*

Livro de Resumos do 16.º Encontro de Investigação Jovem da U.Porto / *Book of Abstracts Young Researchers Meeting of U.Porto*

Universidade do Porto

Vice-Reitor para a investigação e Inovação

Professor Doutor Pedro Rodrigues

ijup@reit.up.pt

ISBN

978-989-746-356-3

Design

Serviço de Comunicação e Imagem da U.Porto

20670 | Development of novel Eucalyptol - Sawdust composite for the slow-release of odours from plywood

Cardoso, Miguel, CIQ(UP) – Research Center in Chemistry, DEGAOT, Faculty of Sciences, University of Porto, Porto, Portugal

Logvina, Yuliya, Strong Export, Lda. Taíde, CIQ(UP) – Research Center in Chemistry, DEGAOT, Faculty of Sciences, University of Porto, Porto, Portugal.

Fernandes, Sónia, Strong Export, Lda. Taíde, CIQ(UP) – Research Center in Chemistry, DEGAOT, Faculty of Sciences, University of Porto, Porto, Portugal.

Silva, Luís P., CIQ(UP) – Research Center in Chemistry, DEGAOT, Faculty of Sciences, University of Porto, Porto, Portugal

Silva, Joaquim E., CIQ(UP) – Research Center in Chemistry, DEGAOT, Faculty of Sciences, University of Porto, Porto, Portugal

Abstract

Taking into account the recent increased interest in products made from environmentally friendly and natural ingredients, as well as reusing the waste, including innovative products in the wood industry and considering the wish of customers to have a pleasant long-lasting smell indoors, we were developed a new sustainable product based on one-side laminated plywood with novel composite Eucalyptol – Sawdust finish.

This finish aims to serve as a mechanical Eucalyptol release impediment for a longer release-acting period. To properly evaluate Eucalyptol release, it was first developed an analytical procedure for its determination, which was based on gas chromatography coupled with a flame ionisation detector (GC – FID). This procedure allowed the quantification of Eucalyptol with Limits of Detection (LOD) and Quantification (LOQ) of 0.70 g/m^3 and 2.11 g/m^3 , respectively, and with linearity up to 18.6 g/m^3 . Sawdust was characterized in terms of granulometry, moisture content and scanning electron microscopy (SEM) porosity evaluation, to determine the best Eucalyptol – Sawdust ratio for odour absorption, for the first time for this purpose. Evaluation of the Eucalyptol release from the composite was performed during a six-month period. It was found that the release occurred with an exponential decay performance and a first-order velocity constant of 0.0169 per day. The half-life was determined to be of 48 days. It was also found that the duration of Eucalyptol release is dependent on the quantity of the composite, having been determined a relationship between amount of composite and aperture diameter. Thus, a new composite was developed for the controlled and slow release of odours, thereby providing a framework for the design of novel wood products with commercial value.

Acknowledgements

We thank the NORTE 2020 through funding of project NORTE-01-0247-FEDER-045182 of Strong Export, Lda, also the University of Porto and particularly DEGAOT, CIQUP, CEMUP and FCT.