

BOOK OF ABSTRACTS



28th INTERNATIONAL SYMPOSIUM ON

ADVANCED IN EXTRACTION TECHNOLOGIES

Partners



ELSEVIER



The ExTech symposium series (International Symposium on Advances in Extraction Technologies)

The ExTech symposium series (International Symposium on Advances in Extraction Technologies) is the premier international event in analytical chemistry, focusing on the areas of sampling and sample preparation. The idea of creating this worldwide conference started in 1999 by Professor Janusz Pawliszyn (University of Waterloo, Canada).

Since then, the symposium has travelled annually around the world.

Its program covers all aspects of sampling and sample preparation, including fundamentals, new materials & technologies, miniaturization, automation & robotics, quality assurance, sustainability assessments, and a wide range of applications. In 2026, we anticipate a focus on hyphenated techniques and direct MS, as well as on the increased role of Artificial Intelligence in the analytical workflow.

The symposium will be held in the historical site of the Gembloux Agro-Bio Tech faculty, a beautiful old abbey that now hosts a vibrant research environment. Besides the scientific program, we will offer you plenty of possibilities to network with colleagues in a cosy atmosphere and with amusing social events.

We are excited to welcome you at EXTECH2026!

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GSAC-07: Membrane Micromixer-Assisted Extraction and Micellization of Parthenolide

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Abstract

Parthenolide (PAR), a sesquiterpene lactone, is the main bioactive compound of the plant *Tanacetum parthenium*, which has received considerable attention in pharmaceutical research due to its biological activities, including anti-inflammatory, antitumor and neuroprotective effects. In the last decade, there has been a significant increase in scientific publications investigating the pharmacological potential of PAR. However, its poor aqueous solubility and limited stability represent major challenges for formulation and delivery. This study aims to enhance solubility of PAR from biomass and to encapsulate of PAR into polymeric micelles. Pluronic F127, an amphiphilic block copolymer widely used for micelle formation, approved by the FDA, was employed as the carrier material for the encapsulation of PAR. In this study, a membrane micromixing-based process using Micropore LCD-1 equipment was developed for the simultaneous extraction and encapsulation of parthenolide into polymeric micelles from a biomass of *Tanacetum parthenium*. Firstly, solubilisation of PAR was enhanced by using polypropylene glycol 400. The effects of key process parameters, including biomass granulation, solvent selection, polymer concentration, and solid-to-liquid ratio were investigated to evaluate their influence on PAR yield. After optimizing the extraction conditions using PPG-based systems, micelle formation with Pluronic F127 was examined in different environments, including water, parthenolide solutions, and biomass suspensions, both in the presence and absence of PPG400. To confirm micelle formation after extraction, dynamic light scattering measurements were performed. The addition of PPG400 in the F127 + biomass formulation led to a decrease in micellar size, indicating the formation of smaller and more compact micelles. This study demonstrates a scalable and reproducible strategy for the extraction and preparation of parthenolide-loaded polymeric micelles directly from biomass. By integrating extraction and nanocarrier formation into a single process, the proposed approach offers a sustainable alternative to conventional multistep procedures. The developed methodology provides a promising platform for the production of advanced phytopharmaceutical formulations and may be extended to other poorly soluble plant-derived bioactive compounds.

Acknowledgments

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