Prof. João B. P. Soares  
Editor-in-Chief  
Canadian Journal of Chemical Engineering

20.06.2025

Dear Professor Soares,

Subject: Submission of the manuscript entitled "*Model-based optimal design of experiments for parameter precision: supercritical extraction case*".

We are pleased to submit our manuscript, entitled "Model-based optimal design of experiments for parameter precision: Supercritical Extraction case," the consideration to be published in the Canadian Journal of Chemical Engineering. This manuscript has not been previously published and is not being considered for publication elsewhere.

Supercritical extraction is an evolving technology in industry since carbon dioxide is used instead of harmful chemicals, making it safer for people and the environment. Thus, there are no traces of toxic solvents, which makes it ideal for food, cosmetics, and medicine. The extraction works at low temperatures, so delicate compounds (like vitamins, oils, or flavors) stay intact. The technology can be tuned appropriately to extract specific value-added ingredients by changing pressure and temperature. So, it fits well with the circular economy and sustainable manufacturing objectives.

Our study focuses on the supercritical fluid extraction of chamomile flower essential oil, employing a robust modelling framework validated by experimental data collected under diverse operating conditions. Chamomile is a medicinal herb widely cultivated in southern and eastern Europe and overseas, such as Brazil. It has been valued for its therapeutic properties and has been known for its anti-inflammatory, antioxidant, mild astringent, and healing effects. Aqueous chamomile extracts are commonly utilised to alleviate anxiety, hysteria, nightmares, insomnia, and related sleep disorders.

This manuscript builds upon our previous work on utilising supercritical carbon dioxide and the mathematical modelling of extraction processes, continuing a series of publications in this area. It expands on concepts we introduced in previous articles published in the Canadian Journal of Chemical Engineering[[1]](#endnote-1),ii. We believe this manuscript brings novel insights into the mathematical modelling of supercritical extraction design of experiments and aligns well with the journal's scope and interests.

We greatly appreciate your consideration of our manuscript and look forward to your valuable feedback. Please do not hesitate to reach out for additional information or clarification regarding our submission. Thank you for your time and attention.

Sincerely,

Oliwer Sliczniuk Pekka Oinas



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1. [↑](#endnote-ref-1)