

Accepted Manuscript

Title: Current situation and perspectives in drug formulation by using supercritical fluid technology

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PII: S0896-8446(17)30813-6
DOI: <https://doi.org/10.1016/j.supflu.2017.12.038>
Reference: SUPFLU 4163

To appear in: *J. of Supercritical Fluids*

Received date: 3-11-2017
Revised date: 27-12-2017
Accepted date: 27-12-2017

Please cite this article as: Elisabeth Badens, Yasmine Masmoudi, Adil Mouahid, Christelle Crampon, Current situation and perspectives in drug formulation by using supercritical fluid technology, The Journal of Supercritical Fluids <https://doi.org/10.1016/j.supflu.2017.12.038>

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Current situation and perspectives in drug formulation by using supercritical fluid technology

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Keywords: Supercritical CO₂, drug formulation, sustained release drug delivery systems, crystallization, particle generation.

Abstract (about 200 words)

Supercritical fluid (SCF) technology has been applied to drug product development over the last thirty years and drug particle generation using SCFs appears to be an efficient way to carry out drug formulation which will form end-products meeting targeted specifications. This article presents an overview of drug particle design using SCFs from a rather different perspective than usual, more focused on chemical and process engineering aspects. The main types of existing processes are described in a concise way and a focus is put on how to choose the right operating conditions considering both thermodynamic and hydrodynamic aspects. It is shown that the operating conditions and parameters can be easily optimized so as to facilitate the further process scale-up. Furthermore, the new trends in particle generation using SCFs are introduced, related either to new types of drug medicines that are treated or new ways of process implementation methods.

Outline

1. Introduction
2. Current State of particle generation processes
 - 2.1. SCF used as precipitation solvent
 - 2.2. SCF used as precipitation anti-solvent
 - 2.3. SCF used as dispersing agent
3. Challenges
 - 3.1. Particle collection
 - 3.2. Residual solvent content
 - 3.3 SCF consumption, purification and recycling
4. Knowledge Gaps / Needs
5. Future Directions / Perspectives

1. Introduction

The main aim of drug formulation is to fulfil end-product specifications with regard to drug bioavailability, non-toxicity, uniformity, stability and handling properties. It is possible to enhance drug

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