

Accepted Manuscript

Scaling laws and size effects for amorphous crystallization kinetics: Constraints imposed by nucleation and growth specificities

Marc Descamps, Jean-François Willart

PII: S0378-5173(18)30141-8
DOI: <https://doi.org/10.1016/j.ijpharm.2018.03.001>
Reference: IJP 17344

To appear in: *International Journal of Pharmaceutics*

Received Date: 22 December 2017
Revised Date: 1 March 2018
Accepted Date: 2 March 2018

Please cite this article as: M. Descamps, J-F. Willart, Scaling laws and size effects for amorphous crystallization kinetics: Constraints imposed by nucleation and growth specificities, *International Journal of Pharmaceutics* (2018), doi: <https://doi.org/10.1016/j.ijpharm.2018.03.001>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.



**Scaling laws and size effects
for amorphous crystallization kinetics:
Constraints imposed by nucleation and growth specificities**

Marc Descamps^{†*}, Jean-François Willart[†]

[†] *Université de Lille, CNRS UMR 8207 – UMET – Unité Matériaux et Transformations, F-59000, Lille – France.*

*corresponding author: marc.descamps@univ-lille1.fr

(33) 03 20 43 49 79

Abstract. In the present paper we review different aspects of the crystallization of amorphous compounds in relation to specificities of the nucleation and growth rates. Its main purpose is: i) to underline the interest of a scaling analysis of recrystallization kinetics to identify similarities or disparities of experimental kinetic regimes. ii) to highlight the intrinsic link between the nucleation rate and growth rate with a temperature dependent characteristic transformation time $\tau(T)$, and a characteristic size $\xi(T)$. The consequences on the influence of the sample size on kinetics of crystallization is considered. The significance of size effect and confinement for amorphous stabilization in the pharmaceutical sciences is discussed.

Keywords: Amorphous state, crystallization, nucleation and growth, scaling, size effect.

Download English Version:

<https://daneshyari.com/en/article/8520095>

Download Persian Version:

<https://daneshyari.com/article/8520095>

[Daneshyari.com](https://daneshyari.com)