

## Accepted Manuscript

Supercritical Assisted Atomization to produce nanostructured chitosan-hydroxyapatite microparticles for biomedical application

Ernesto Reverchon, Renata Adami

PII: S0032-5910(13)00393-8  
DOI: doi: [10.1016/j.powtec.2013.05.035](https://doi.org/10.1016/j.powtec.2013.05.035)  
Reference: PTEC 9606

To appear in: *Powder Technology*

Received date: 7 February 2013  
Revised date: 14 May 2013  
Accepted date: 17 May 2013



Please cite this article as: Ernesto Reverchon, Renata Adami, Supercritical Assisted Atomization to produce nanostructured chitosan-hydroxyapatite microparticles for biomedical application, *Powder Technology* (2013), doi: [10.1016/j.powtec.2013.05.035](https://doi.org/10.1016/j.powtec.2013.05.035)

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.

# Supercritical Assisted Atomization to produce nanostructured chitosan-hydroxyapatite microparticles for biomedical application

Ernesto Reverchon<sup>a,b</sup>, Renata Adami<sup>a\*</sup>

<sup>a</sup>Department of Industrial Engineering, University of Salerno  
Via Ponte Don Melillo 1, 84084 Fisciano (SA), ITALY

<sup>b</sup>Research Centre for Nanomaterials and nanoTechnology (NANOMATES), University of Salerno,  
ITALY

E-mail: radami@unisa.it\*

## Abstract

Supercritical Assisted Atomization (SAA) has been applied to the production of coprecipitates formed by hydroxyapatite nanometric particles and chitosan, used as binding agent.

Precipitation temperatures between 90°C and 110°C have been used and a chitosan concentration lower than 20 mg/mL has been required to avoid microparticle coalescence. Furthermore, to obtain a good compromise between particle size and hydroxyapatite loading, a gas to liquid ratio of 1.8 was adopted. The best operating conditions for particle diameter and coprecipitate stability were: precipitation temperature 110°C, chitosan concentration in the starting solution 10 mg/mL, that produced spherical composite microparticles with a mean diameter of 0.6 µm and a loading efficiency of about 91%. The nanostructure and particle surface roughness has been modulated varying hydroxyapatite percentages in the starting suspension. The results obtained have been explained in terms of suspension stabilization and atomization efficiency. Possible biomedical applications for these powders are described.

## Keywords:

Supercritical, atomization, chitosan, hydroxyapatite, microparticles, nanostructured

Download English Version:

<https://daneshyari.com/en/article/6678176>

Download Persian Version:

<https://daneshyari.com/article/6678176>

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