

Accepted Manuscript

Title: Nanofiller for the mechanical reinforcement of maltodextrins orodispersible films

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PII: S0144-8617(15)00942-X
DOI: <http://dx.doi.org/doi:10.1016/j.carbpol.2015.09.077>
Reference: CARP 10379

To appear in:

Received date: 15-7-2015
Revised date: 22-9-2015
Accepted date: 23-9-2015

Please cite this article as: Franceschini, I., Selmin, F., Pagani, S., Minghetti, P., and Cilurzo, F., Nanofiller for the mechanical reinforcement of maltodextrins orodispersible films, *Carbohydrate Polymers* (2015), <http://dx.doi.org/10.1016/j.carbpol.2015.09.077>

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1 Highlights

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- 3 • Polyvinyl acetate (PVAc) nanoparticles improved the tensile properties of maltodextrin films.
- 4 • Maltodextrin and PVAc are immiscible.
- 5 • Plasticizers favored the homogenous dispersion of PVAc to the concentration of 10% w/w.

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7 Nanofiller for the mechanical reinforcement of maltodextrins orodispersible films

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22 Abstract

23 One of the most critical quality attributes of orodispersible films (ODFs) is related to the development of
24 dosage forms with tensile properties suitable for the packaging and patient's handling. Aiming to develop a
25 strategy to reinforce the tensile properties, the current work reported the feasibility to improve the tensile
26 strength of maltodextrins (MDX) based ODFs by adding an amorphous water insoluble nanofiller, namely
27 polyvinylacetate (PVAc).

28 The possible interactions between components investigated by DSC and ATR-FTIR spectroscopy revealed
29 that MDX and PVAc were immiscible; even if, the presence of plasticizers permitted the homogeneous
30 dispersion of PVAc in the film until the 10% w/w concentration was reached. As a consequence, PVAc
31 nanoparticles was found to be an effective reinforcing agent only at the concentrations of 3 and 5 % w/w.
32 In this optimal range, the tensile strength increased at least 1.5 fold and the elastic modulus increased at
33 least 4 times.

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35 Keywords

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