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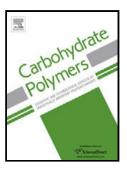
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## ACCEPTED MANUSCRIPT

Chitosan adsorption on nanofibrillated cellulose with different aldehyde content and interaction with phosphate buffered saline

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## **Highlights**

- Aldehyde content of nanofibrillated cellulose affects chitosan adsorption.
- The adsorption behaviour chitosan completely changes after acetic acid treatment.
- Acid treated chitosan has more capacity to uptake PBS.
- Liquid interaction with chitosan/NFC matrix is limited by chitosan presence.

#### **ABSTRACT**

The chitosan adsorption on films prepared using nanofibrillated cellulose (NFC) with different content of aldehyde group was studied by means of Quartz Crystal Microbalance with Dissipation (QCM-D). Results showed that frequency change ( $\Delta f$ ) was higher when the chitosan adsorbed on NFC film consisting more aldehyde group indicating the higher adsorption. The ( $\Delta f$ ) and dissipation ( $\Delta D$ ) factors completely changed during adsorption of chitosan pre-treated with acetic acid:  $\Delta f$  increased and  $\Delta D$  decreased, oppositely to un-treated chitosan adsorption. After acid treatment, molecular weight and crystallinity index of chitosan decreased addition to change in chemical structure. It was found that more phosphate buffered saline (PBS), as a model liquid for wound exudate, adsorbed to acid treated chitosan-NFC film, especially to film having more aldehyde groups. Comparing with bare NFC film, chitosan-NFC

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