**Roll-to-Roll Coating of ChNF and CNC Bilayer Thin Film**

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**Extended Abstract (ten page maximum):**

Cellulose and chitin are two of the most abundant naturally produced biopolymers that can be isolated and used as sustainable barrier materials for various packaging applications, such as food, electronics, and pharmaceuticals. However, one major challenge associated with these barrier materials is cost efficient scalable manufacturing. The objective of this work is to understand the limitations associated with fabricating barrier layer thin films composed of chitin nanofiber (ChNF) and cellulose nanocrystal (CNC) on Cellulose Acetate substrates. Here, a dual layer slot die on a roll-to-roll (R2R) system is used to fabricate the barrier film, which requires an understanding of the wetting and drying properties pre- and post- deposition, respectively. Wetting property assessments have shown that surface modifications or chemical changes are required to coat the CA substrate, by either solution. It has been found that UV treatments are sufficient, however, a delicate balance between the processing time and temperature is needed. During the drying process, significant warpage and film deformation results when using temperatures that are appropriate for scaled production. Alternative methods for drying the barrier film have been explored, to significantly reduce the drying time from 30 mins. This work provides a pathway to cost efficiently and quickly fabricate sustainable barrier films.