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**Effects of Hydrophobic-Modified Cellulose Nanofibers (CNFs) on Cell
Morphology and Mechanical Properties of High Void Fraction Polypropylene
Nanocomposite Foams**

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Abstract: Nanocomposite foams based on isotactic polypropylene (iPP) and cellulose nanofibers (CNFs) with a void fraction as high as 80% were fabricated by a core-back foam injection molding (FIM). The hydrophobic CNFs were modified using alkenyl succinic anhydride. Different rheological curves such as the complex viscosity and $\tan \delta$ - ω curves were investigated to distinguish the effects of CNFs on PP's viscoelastic properties. Fast scanning chip calorimetry (FSC) results revealed that the added CNFs significantly increased the crystallization temperature and accelerated the crystallization process. Consequently, CNFs, especially with a concentration between 1 and 5 wt %, could clearly reduce PP's cell size and increase its cell density. The specific flexural modulus and bending strength were increased when the void fraction was lower than 80%. These

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