

# Wet spinning of cellulose nanofibers (CNF)

**Mechatronics Project**



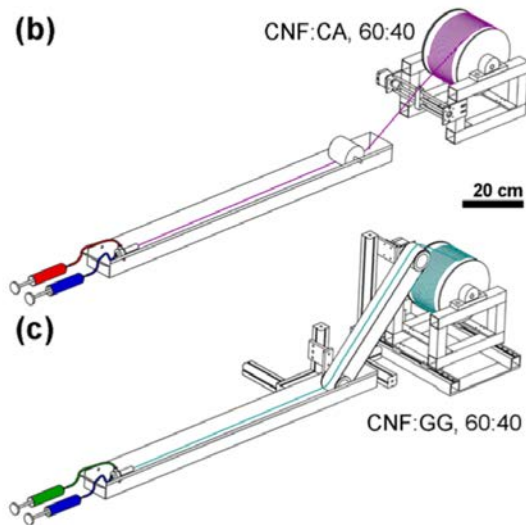
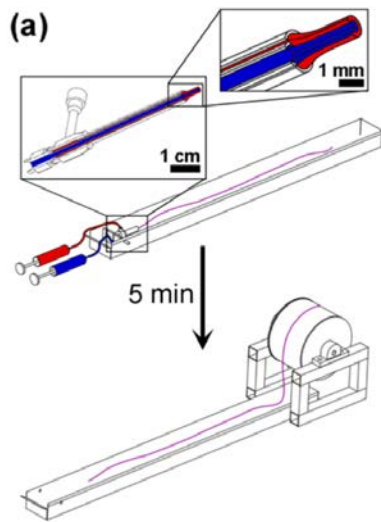
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# Wet spinning of CNF ?

- **Cellulose:** Most abundant biopolymer (found e.g. in wood)
- **CNF:** very small (dimensions in nanoscale) cellulose fibers
  - Interesting properties (e.g. specific strength)
- **Wet spinning:** Process of making filaments / longer fibers from a polymer solution / suspension. “Wet” means that filament formation occurs in a liquid ( a bath)
- **Wet spun CNF filaments:** could be used in textiles, nonwovens, composite reinforcement or precursor to making carbon fibres



Lundahl et. al. (2018)

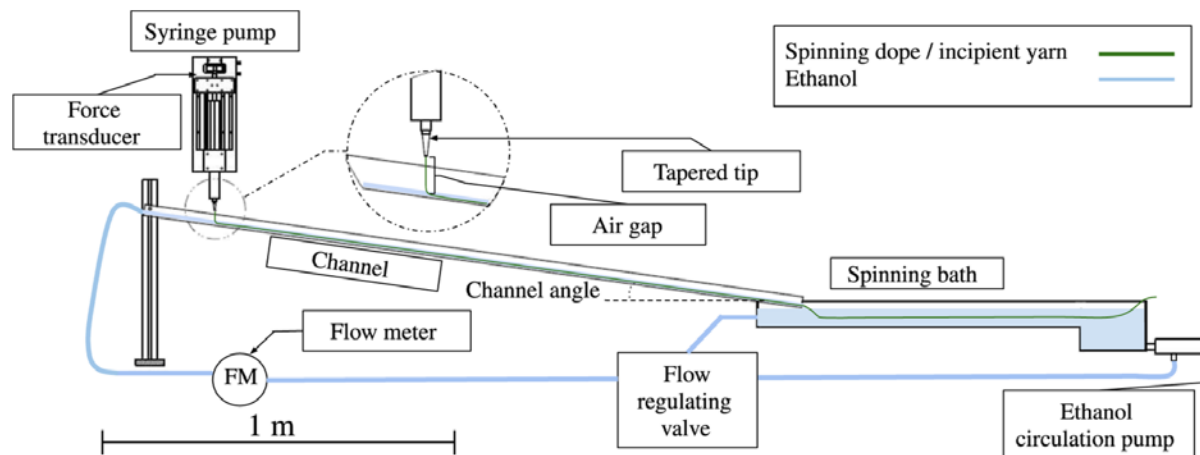
Absorbent Filaments from Cellulose Nanofibril Hydrogels through Continuous Coaxial Wet Spinning

DOI: 10.1021/acsami.8b08153

Klar et. al. (2018)

Spinning Approach for Cellulose Fiber Yarn Using a Deep Eutectic Solvent and an Inclined Channel

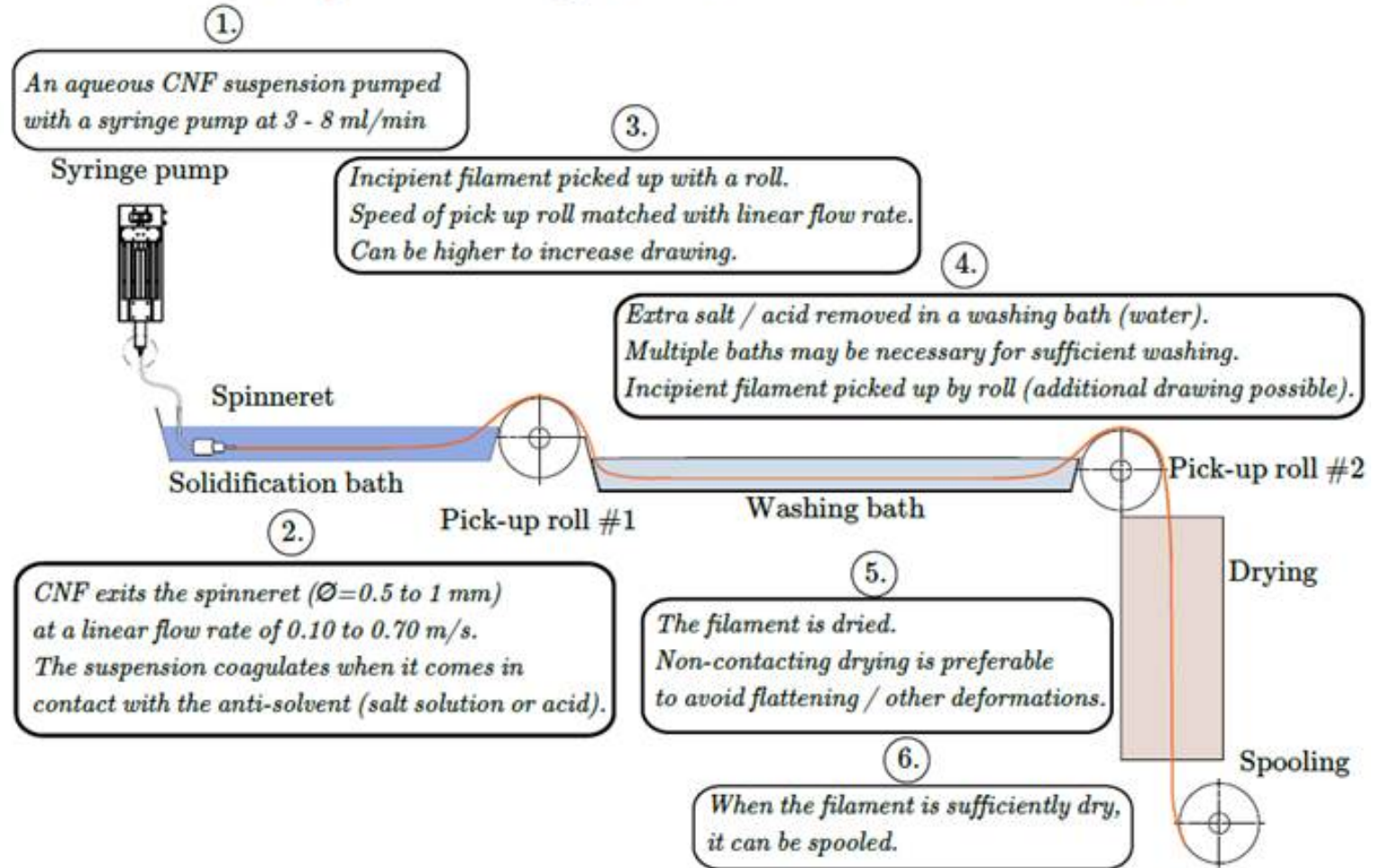
DOI: 10.1021/acsomega.8b01458



# Project overview

- **Your task is to develop a modular spinning line prototype**
  - Evaluate the “dual bath” – approach
- **Includes design of prototype frame, selection and control of actuators (mainly rolls), testing the prototype**
- **Close collaboration with Aalto CHEM**  
(Department of Bioproducts and Biosystems)

# Wet spinning of CNF - Dual bath



A?