

## Superheated steam pretreatment of cellulose affects its electrospinnability for microfibrillated cellulose production

### ABSTRACT

In this study, oil palm mesocarp fiber (OPMF) was pretreated with (1) superheated steam (SHS) and (2) potassium hydroxide (KOH) to remove hemicellulose. Both SHS–OPMF and KOH–OPMF underwent delignification step to isolate the cellulose and dissolved in selected ionic liquid and its co-solvent before being electrospun to obtain microfibrillated cellulose (MFC). FE-SEM images showed that SHS–OPMF cellulose produced discontinuous MFC fiber with diameter ranging from 100 to 500 nm, of which 15.5% were in the range of 100–200 nm; while KOH–OPMF cellulose produced continuous MFC with sizes larger than 200 nm. The differences in fiber size and continuity of fiber produced were due to incomplete removal of hemicellulose from SHS–OPMF sample that inhibited fiber re-coalescence and resulted in interruption in fiber formation.

**Keyword:** Microfibrillated cellulose; Hemicellulose; Superheated steam; Electrospinning