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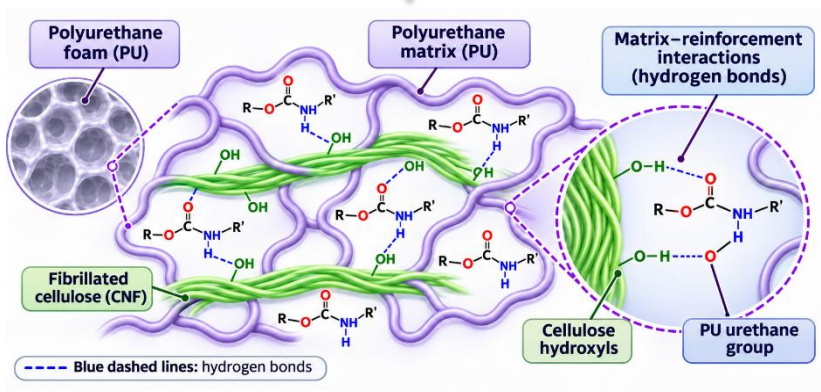
The influence of the degree of defibrillation of microfibrillated cellulose on the mechanical properties of rigid polyurethane foams and elastomers

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Introduction

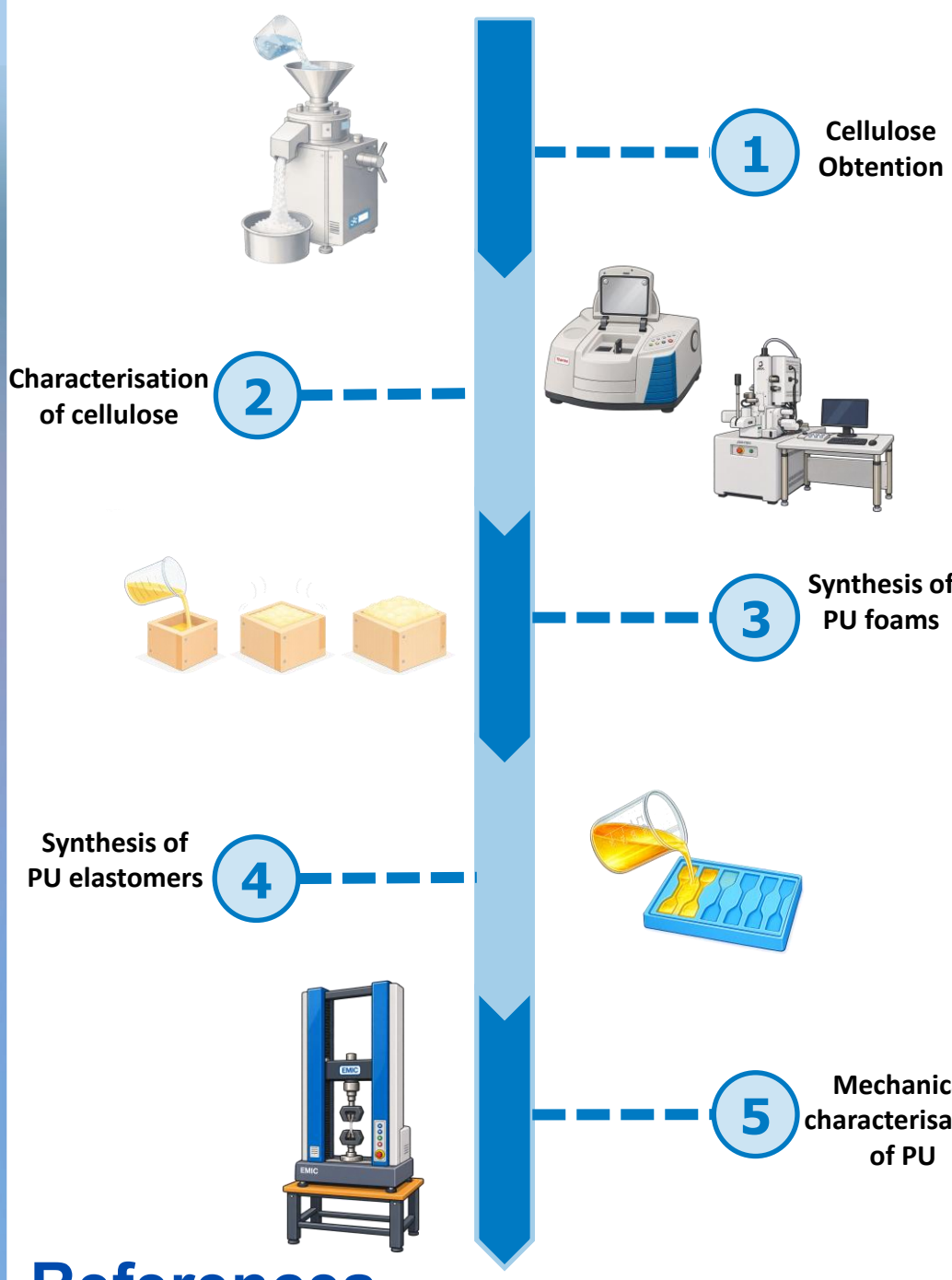




Objectives

To evaluate the influence of the degree of microfibrillation of microfibrillated cellulose (MFC), obtained by different numbers of passes through a Masuko mill (10 and 30), on the mechanical properties of rigid polyurethane (PU) foams and elastomers

Methodology



Results and Discussion

Figure 1. TEM images and histogram of fibre diameter: (a) 10-pass cellulose; (b) 30-pass cellulose.

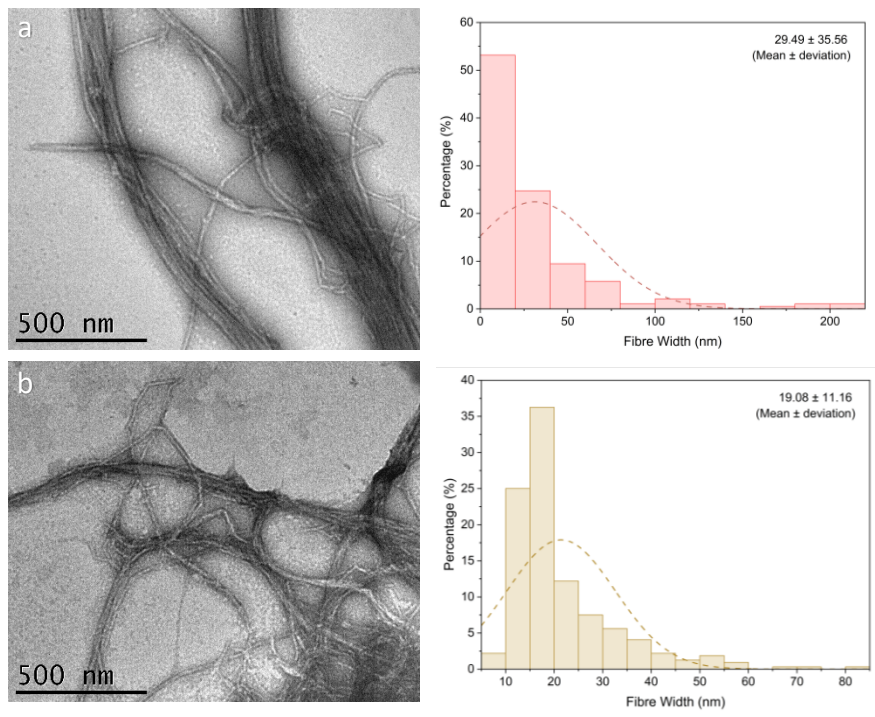


Figure 2. FTIR analysis of cellulose

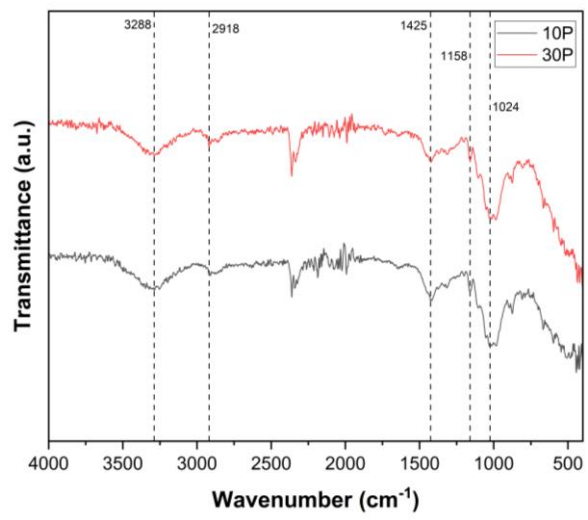
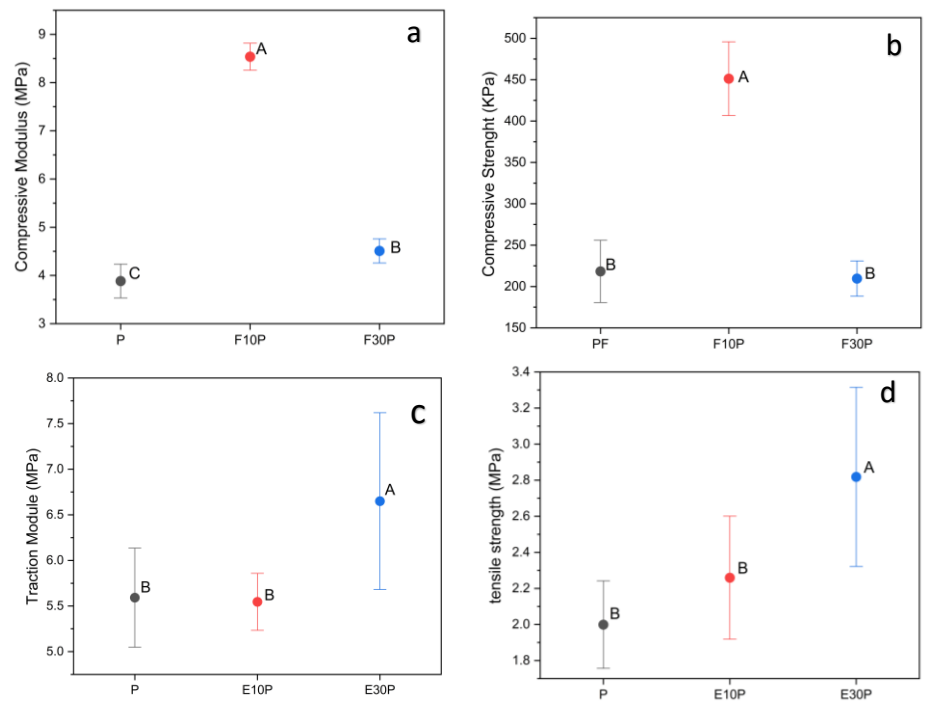


Figure 3. Mechanical characterisation: (a) Compressive modulus; (b) Compressive strength; (c) Tensile Modulus of Elastomers; (d) Tensile Strength of Elastomers



Conclusions

Fibrillation reduced the cellulose diameter from 29.49 to 19.08 nm. In the foams, 10 passes resulted in a compressive modulus of approximately 8.5 MPa and a strength of 450 kPa. In the elastomers, 30 passes improved tensile strength and elongation.

References

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