

## MWP – Young Researcher Abstract 2024

<b>Project title:</b> Hemicellulose-rich paper-grade pulps as raw material for regenerated products	
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<p><b>Abstract</b> (approx. 200 words):</p> <p>Commercial lignocellulose-based regenerated products, such as man-made cellulosic textile fibres, are typically produced from dissolving-grade pulp. The use of hemicellulose-rich paper-grade pulp would enhance resource efficiency as a higher share of the wood ends up in the final product. Previously, hemicellulose-rich raw materials have been avoided due to their undesirable reactivity with the industrial solvent systems. Superbase ionic liquids have demonstrated potential for processing these more complex raw materials. In this work, hemicellulose-rich textile fibres were produced from softwood and eucalyptus paper-grade pulps using novel superbase ionic liquid, [mTBNH][OAc]. Before dissolution and spinning, pulps were pretreated enzymatically or chemically to improve dope rheology for dry-jet wet spinning. Eucalyptus dissolving pulp was used as a reference. The spun fibres had high dry tenacities and hemicellulose was found to regenerate to a high extent. The high hemicellulose quantity did not deteriorate the mechanical properties of the regenerated fibres since the values were similar to the reference fibres with low hemicellulose content. The dissolution and regeneration process did not cause major degradation or chemical modifications of xylan indicating that a broader raw material base for regenerated products could be achieved with novel solvent systems.</p>	
<p><b>Key words:</b> Regenerated products, Regenerated fibres, Kraft pulp, Hemicellulose, Ionic liquid, Endoglucanase</p>	