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利用課題名(日本語) :マイクロ流路デバイスを用いたセルロースナノクリスタルの調製・精製・ファイバー形成 2
Program Title (English) :Fabrication of microfluidic device for continuous cellulose nanocrystal production 2
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1. 概要(Summary)

Wood is a strong and stiff material like steel but is also lightweight, durable, and flexible which originates from the highly ordered cellular and anisotropic characteristics of cells, making it easily processible. Wood is known to be one of the high performance materials used by human society till date in their daily life applications. Strategic delignification without damaging the internal microstructure of wood provides a unique approach to develop smart material. Understanding the mechanical properties of the Delignified wood post-chemical modification is the main aim of this study.

2. 実験(Experimental)

【利用した主な装置】

超微小材料機械変形評価装置

【実験方法】

The Delignified and densifed wood blocks were cut into the size dimension of 1 cm x 1cm and with a thickness of ~20 μm with a smooth surface. The samples were indented with a diamond probe (Triangular pyramidal indenter Ridge angle 115 °) equipped with a load cell of 100 mN and change in depth was analyzed. Three replicated for each samples were performed.

3. 結果と考察(Results and Discussion)

The mechanical properties of the densified wood samples were very high in range of 800-1000 MPa. This could be due to densification of wood samples which improves the fiber bonding between adjacent cellulose fibers through hydrogen bonding. We are currently carrying out modification on wood and would carry out more experiments to get a detailed understanding.

4. その他・特記事項(Others)

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5. 論文・学会発表(Publication/Presentation)

なし。

6. 関連特許(Patent)

特許出願中