Technical cellulosics have limited reactivity due to high crystallinity, yet increased reactivity is needed for swelling, chemical modification and the general further utilisation of cellulose. Current solvent-based methods to reduce cellulose crystallinity dissolve the cellulose and thus have a detrimental effect on the morphology of the material after regeneration. This also complicates recycling all components.

A novel solution utilising tailored ionic liquids (IL) has been developed. It allows conversion of cellulose into amorphous cellulose or cellulose II without dissolving the bulk material.

Different reaction, e.g. chemical modification for materials production and saccharification for biofuels/chemicals production, are being tested to assess the scope of the IP and potential for future IP.

The fibrous structure of the lignocellulosic material does not collapse during the process offering significant benefits:

- Enhances reactivity in the following chemical modification steps.
- Enables wider range of chemical modification procedures.
- Provides access to faster and higher saccharification yields.
- Cellulose is easily regenerated, much lower addition of a non-solvent is required.
- IL is easily recovered as it is not incorporated in the fibrous structure.

**Invention:** Converting cellulose into amorphous cellulose without dissolving the bulk material.

**Application:** Chemical modification of cellulose with several utilisation possibilities for the modified materials.

**Unmet need:** The technology does not destroy the cellulose morphology during modification and provides easy regeneration of cellulose.

**IP Status:** Patent pending.

**Project phase:** Proven in laboratory scale, ongoing research on the modification procedure.

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