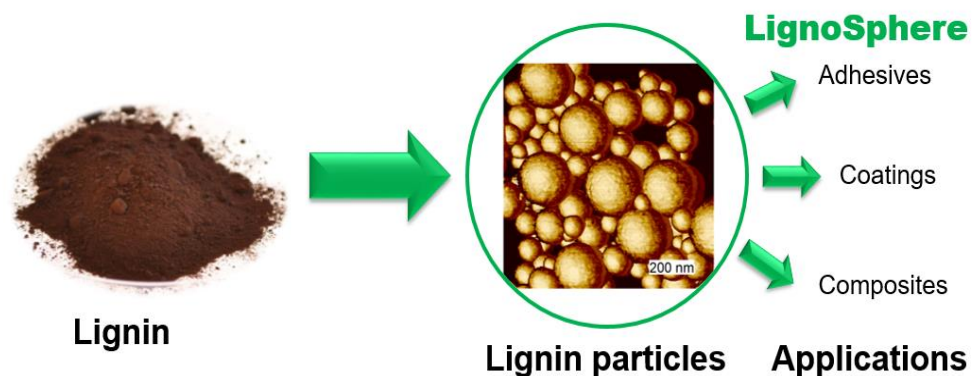


LignoSphere - spherical lignin particle as a platform material for sustainable adhesives and beyond

Within the forest industry there is high interest in converting lignin into high value added products. So far the inhomogeneity, high viscosity, and lack of reactivity of lignin have created barriers for its large-scale implementation. At Aalto University, we have developed a novel technology to refine lignin to stable spherical particles, which we call lignospheres. We expect that lignospheres can help solve many of the current bottle-necks in lignin utilization and reduce or fully replace petrochemicals in adhesives, coatings, and composites.



In the LignoSphere project we aim to convert industrial lignin side-stream into value-added products. Our concept addresses this challenge with a sustainable and energy efficient means by converting lignin into lignin nanospheres (lignospheres). The general properties of lignospheres allow them to be used as a platform chemical suitable for many applications, which have been attempted before, but with limited success, and even some applications where lignin has not even been considered. During the project we will focus on adhesives, coatings and composites.

The LignoSphere process can be integrated to pulp mills and biofuel plants, which would bring new business to existing companies. This process also reduces the production cost of the lignin nanospheres enough to be competitive with the petrochemical polymers. We plan to convert this proof-of-concept process into a semi-continuous process, which will be used to optimize the process parameters, especially in terms of maximal output and minimal energy consumption, aided by experimental results and process simulations. Business Finland has granted TUTLI funding for commercialization of the process.

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