

Master thesis/project work on 'Aggregation phenomena of biopolymer resins on cellulose fibers'

Everybody who ever visited a forest knows biopolymer resins, very often referred to as pitch, excreted through damaged areas in the bark of trees. These resins are a valuable resource for the production of new biobased materials, such as biobased polyesters for instance. However, during the production of cellulose fibers and pulps they enter process cycles and are involved in many interaction processes. In the case of cellulose, it is speculated that they adsorb on their surface, thereby blocking the surface for other chemicals needed in different cellulose processing industries.

In this project work/master's thesis, we aim at a better understanding of the influence of pitch stemming from a paper mill on material properties. The tasks of the work are to identify the components of the pitch (e.g. by GC-MS; LC-MS), charge demands of these components (zeta potential), to study the aggregation behavior in aqueous solutions (e.g. by dynamic light scattering, small angle x-ray scattering) and to elucidate its interaction mechanism with cellulosic fibers and cationic starch, a major additive in paper technology. Depending on the progress of the project, also hand sheets will be prepared and the influence of pitch on the paper quality, formation and starch retention, i.e. the amount of starch which is retained in the paper after pressing is determined. The work is part of the CD Laboratory for Fiber Swelling and Paper Performance.



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