

INVESTIGATIONS CONCERNING THE SYMPLEX FORMATION BETWEEN CATIONIC STARCH AND ANIONIC POLYELECTROLYTES

Cationic starch derivatives are added to the fibre suspension in the papermaking process in order to improve dry strength and retention.

To an increasing extent, process water is kept in a closed loop. As a consequence, interfering substances accumulate in this water, many of which bear negative charges. These can interact with cationic groups of starch additives and thus negatively influence their effectiveness.

Dynamic light scattering permits determination of size distributions of symplexes formed by the cationic and anionic components. In this way, a comparison of the interaction potential of various starch derivatives and anionic contaminants is possible.

Figure 1 visualises the result of an interaction experiment of lignin sulfonate and cationic potato starch (blue curve) and cationic maize starch (green curve). Only in case of the potato starch, there is a fraction of symplexes bigger than 1000 nm. Cationic potato starch interacts more strongly with carboxymethylcellulose than with lignin sulfonate (Figure 2).

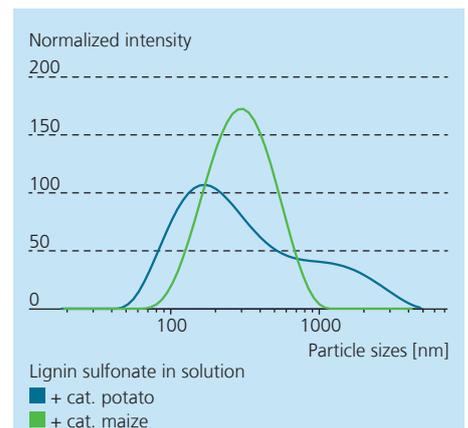


Fig. 1 Particle size distributions of symplexes formed between anionic lignin sulfonate and potato and maize starch.

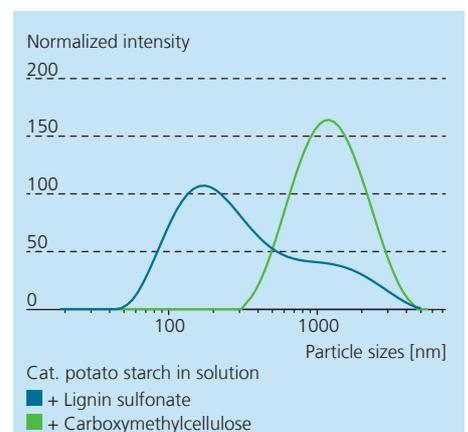


Fig..2 Particle size distributions of symplexes formed between cationic potato starch and lignin sulfonate and carboxymethyl cellulose.

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