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## The performance of chitosan with bentonite microparticles as wet-end additive system for paper reinforcement

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Research Highlights:

- 1- Chitosan showed potential as a dry strength additive in CMP pulp in acidic pH.
- 2- A low percentage of bentonite dosage in combination of 1.25% and 2% chitosan could improve the performance of chitosan polyelectrolyte which led to form a successful micro-particle system. It seems that it may make a bridging between different chitosan molecules.
- 3- the ratio of cation and anion is very critical. this ratio shouldn't disturb the electrostatic equilibrium for creating suitable flocs.

### Abstract

In this research, the effect of bentonite micro-particles on the performance of chitosan as a new additive system for improving the dry strengths of acidic papermaking was studied. Chitosan, an abundant carbohydrate biopolymer, in 4 dosages (0, 0.75, 1.25 and 2% based on dry weight of pulp) was applied with bentonite in 4 dosages (0, 0.3, 0.6 and 0.9% based on oven-dry weight of pulp). Although the addition of chitosan up to 0.75% (without bentonite) improved tensile index and burst index, but the addition of more chitosan decreased all mechanical properties in comparison with the control sample. The application of bentonite in combination with chitosan had a significant impact on chitosan performance in mechanical properties. The best results were obtained with 0.3% bentonite

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