463a Novel Approach for Producing High Yield and High Brightness Tmp in Peroxide Bleaching

Yulin Zhao and Yulin Deng

Today peroxide bleaching is the dominating bleaching process for the thermomechanical pulping (TMP). In this research, a novel approach was proposed to produce high yield peroxide bleached TMP pulp by reduction of carbohydrates losses. The concept of the approach was to avoid the primary alkali-catalyzed peeling of polysaccharides by crosslinking the hydroxyl groups of the reducing aldehyde end groups of the polysaccharide chains with effective crosslinker, and selectively crosslink degraded hemicelluloses and cellulose on fibers. Because both hemicelluloses and cellulose are polysaccharides that are significantly different from lignin, it is possible to retain hemicelluloses and dissoluble carbohydrates on fiber wall by developing effective crosslinking chemistry. It was surprising to see that bleaching ability of peroxide could also be significantly improved by the new technology. The possible mechanisms of the novel technology for improving peroxide bleaching ability and yield were proposed by the 13C NMR, UV-VIS and FTIR spectroscopy analysis.