

The Effect of Preheating Treatment and non-simultaneous Addition of Chemicals on the Efficiency of Hydrogen Peroxide Bleaching of Chemi-mechanical pulp(CMP)

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Abstract

In this research the effect of heating pretreatment and non-simultaneous addition of chemicals in hydrogen peroxide bleaching of CMP pulps was investigated. Before the bleaching stage by hydrogen peroxide. Q stage was applied by means of removing transition metals from pulps by using of DTPA pretreatment under the same condition for all pulps. For this purpose, unbleached mixed hardwood CMP pulp was used. Hydrogen peroxide bleaching operation was done with three different procedures including: adding bleaching chemicals simultaneously, adding bleaching chemicals non-simultaneously and adding bleaching chemicals with heating pretreatment at two hydrogen peroxide levels of 2 and 3% and in NaOH/H₂O₂ proportions of 0.8 and 0.7 with 3% sodium silicate at 70°C for 150min at 10% consistency level.

Results obtained from measuring optical and physical properties of handsheets showed that in all treatments at the same peroxide charge, non-simultaneous addition of chemicals with pretreatment (process 3) caused better improvement in brightness and density of the paper. Also opacity, yellowness and caliper were lower in this process than the others. To reach a given brightness, hydrogen peroxide can be decreased. Therefore, by using the modified bleaching process we can economize on consumption of chemicals, by decreasing peroxide and alkali consumption at 1% and 23.8% to reach a given brightness. Also, COD load in this process at both levels of peroxide was lower than the other processes and therefore, it may decrease environmental contamination and effluent treatment requirement.

Keywords: Chemi-mechanical pulp. Hydrogen peroxide. Preheating treatment. non-simultaneous addition of bleaching chemicals, Chemical oxygen demand (COD)

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