Effects of alkaline sulfite anthraquinone and methanol pulping conditions on the mechanical and optical paper properties of bamboo (Gigantochloa scortechinii)

ABSTRACT

The objective of this study was to evaluate the mechanical and optical properties of paper made from alkaline sulfite anthraquinone and methanol (ASAM) unbleached pulp from bamboo (Gigantochloa scortechinii). The bamboo pulps were beaten using a PFI mill at 10,000 revolutions. To determine the properties of unbleached bamboo ASAM paper, handsheets with a density of 60 g/m2 were formed with 14 to 18% NaOH, 80/20 Na2SO3/ NaOH, 0.1% AQ, 0.5% EDTA, and 15% methanol pulping conditions. Pulping at 18% NaOH for 120 min cooking time produced paper with properties of 24.8 Nm/g and 43.02% for the tensile index and ISO brightness, respectively. Cooking at 16% sodium hydroxide for 90 min rendered the best results for mechanical and optical properties, with results of 20.86 Nm/g, 22.64 mN.m2/g, and 39.32% ISO value for the tensile, tear indices, and brightness, respectively. High quality bamboo paper produced by the ASAM pulping process was beneficial for producing highly durable paper and paperboard.

Keyword: ASAM pulp; Bamboo; Brightness; Burst index; Tensile index