

Saccharification Optimization of Enzymatic Pretreated Sawdust

Abstract. The saccharification of laccase-pretreated sawdust was optimized using one-factor-at-a-time (OFAT) and response surface methodology (RSM). OFAT studies of saccharification of the pretreated sawdust showed that the sawdust was best saccharified at the following conditions: cellulase concentration of 30 IU/g of sawdust, substrate concentration of 5.0% w/v, 50 °C, saccharification time of 36 h, and pH 5 where high yield of sugar obtained. Based on our previous pretreatment process of sawdust the optimized condition of pretreatment was achieved at sawdust size 1 mm, substrate concentration 5% (w/v), laccase enzyme concentration 20 IU/g, temperature 35°C, pH 5, and time 10 h at an agitation rate of 150 rpm. Since the condition of pretreatment and saccharification almost the same, and saccharification at 37 degrees gives good sugar, the integration of the two processes was investigated. The integration can be carried out without losses in the achieved sugar concentrations and yields. By this combination, the time required for these two steps could be shortened and saved. This integration may it combined with fermentation as one step, if fermentation conditions of same substrate were optimized.