

OPTIMIZATION OF PARAMETERS FOR BIOCONVERSION
OF STARCH TO GLUCOSE

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The synergistic effect of alpha amylase and glucoamylase on the hydrolysis of starch suspension was studied. The additive effect of increasing amounts of glucoamylase to a fixed amount of alpha amylase and vice versa were studied. From these experiments the optimum ratio of glucoamylase to alpha amylase was found to be 0.8 AUN/1.0 KNU*. Having determined the glucoamylase to alpha amylase ratio, the properties of the enzyme mixture were studied in the buffer medium and in the buffer medium containing the aqueous two-phase system of 3% (w/w) crude dextran and 5% (w/w) polyethylene glycol (M.Wt 20 000). The rate of hydrolysis of starch in the aqueous two-phase system was faster than that in the buffer medium. The temperature optimum, pH optimum and the optimum acetate concentration were found to be 70°C, 4.6 and 0.025M respectively. These values were same for the buffer medium and for the aqueous two-phase system. The apparent Michaelis constant (K_m) of the enzymes mixture for starch (in suspension) was found to be 16% both for the aqueous two-phase system and buffer medium, whereas the V_{max} values in aqueous two-phase system and in buffer medium were found to be 19.8% and 17.5% (w/w) glucose per 30 min respectively. Both alpha and glucoamylase were found to be more stable in the medium containing polymers than in the buffer medium.

*AUN is Nove Amyloglucosidase Unit; KNU is Kilo Novo Unit.