CHAPTER V

CONCLUSION

1. Different kinds of starch gave different cyclodextrin yields. Potato and sago gave the highest yield of 42% under standard condition (2.0 g% starch, CGTase 500 U/g starch, 40 °C, 17 hrs). Rye gave the lowest yield of 27%. For cassava starch, the yield was 37% and α: β: γ- CD was 2.8: 3.7: 1.
2. Amylopectin was the better substrate for CGTase than amylose. However, no direct correlation between the amylose and amylopectin content with % CD yield.
3. Using gelatinized cassava starch, the optimum condition for total CD and β- CD productions was 2.5 g% cassava starch, CGTase 500 U/g starch at 40 °C for 8 hrs. The total CD yield was 35% and α: β: γ- CD was 1: 2.76: 1.66. For α- CD production, the optimum condition was 2.5 g% cassava starch, CGTase 1,250 U/g starch, for 16 hrs at 40 °C. Total CD yield was 35% and α: β: γ- CD was 10.8: 12.7: 1.
4. For starch liquefication step prior to CGTase catalysis, the best condition per gram starch was respective treatments with 96 U pullulanase (60 °C for 24 hrs) and α - amylase 0.0024 U (60 °C for 2 minutes). The total yield was about 40% and significant increased in β- CD was observed.
5. DP 9 fraction from partially purified α-amylase treated cassava hydrolysate gave the highest total CD (37%) with β-CD as the major product. Alpha- CD was the major product if fractions of DP 20-82 were used.
6. DP 26 fraction from partially purified pullulanase treated cassava hydrolysate gave the highest total and β-CD yields. The DP 15 fraction gave more α-CD than β-CD but the total yield was considerable less (27% vs 9%).
7. Addition of complexant into the CGTase reaction mixture could enhance CD production. The degree of enhancement and the ratio of α: β: γ- CD varied with kind of complexant, enzyme concentration and time of incubation.

8. The optimum condition for α-CD production was incubation of 2.5g% gelatinized starch with CGTase 500 U/g starch in the presence of 20 % (v/v) ethanol for 36 hrs at 40 ^{o}C. The total CD yield was 39.0 % and α-CD was high proportion produced around 20 % of the total CD production. The other optimum condition of α-CD production was incubation of 2.5 g % gelatinized starch with 1,500 U/g starch without any addition of complexant at the same condition as above. The total CD yield was 28% and α-CD was high proportion produced around 53 % of the total CD production.
9. The optimum condition for β- CD production was incubation of 2.5 g% gelatinized cassava starch with CGTase 500 U/g starch and 20% (v/v) 2-butanol for 36 hrs at 40 ^{o}C. The total CD yield was 51.9% and β- CD was the major product, constituting for 95%.
10. The optimum condition for γ- CD production was incubation of 2.5 g% gelatinized starch with CGTase 50 U/g starch in the presence of 20% (v/v) ethanol for 36 hrs at 40 ^{o}C. The total CD yield was 33% and γ- CD was high proportion produced around 26.8%.