

CHAPTER V

CONCLUSIONS

The thickness of gel formation was depend upon the *A. xylinum* strains. The cellulose content (g cellulose/g dry wt) of three strains of *A. xylinum* were not different ($P \geq 0.05$), but the significant difference of cellulose yield (g dry wt basis) from these three strains were detected.

The sugars, used as carbon source, affected the gel formation of *A. xylinum*. Among these three strains, glucose and sucrose medium gave the thickest gel formation.

The compositions of medium, especially vitamins and growth factors, affected the *A. xylinum* gel formation. The coconut water medium gave the better cellulose yield than that in synthetic medium.

Cellulose content and yield of cellulose were influenced by surface area of tray. Because of high Dissolved Oxygen (DO) levels in the biggest tray decreased the need for cellulose formation of *A. xylinum*, while low DO levels in the smallest one limit the growth of this microorganism.

The optimum condition for CMC production from cellulosic gel was as followed :

1. Nata cellulosic gel was dried by drum drier and blended and called as nata cellulose powder.
2. Ratio of nata cellulose powder to distilled water (w/v) was 1.0 : 2.0
3. Ratio of nata cellulose powder to sodiumhydroxide (w/w) was 1.0 : 3.0

4. Ratio of nata cellulose powder to sodiumchloroacetate(w/w) was 1.0 : 1.44
5. Mixing for 6 hours.
7. Incubating for 36 hours
8. Ratio of reaction mixture to hot water (w/v) was 1.0 : 12.5
9. Final concentration of ethanol for CMC precipitation was 70%

Properties of CMC from cellulosic gel were as followed :

Relationship between temperature and viscosity of CMC solution, at higher temperature, viscosity was decreased. It could be assumed that bond within CMC solution was broken by high temperature.

Relationship between pH and viscosity of CMC solution, it was found that viscosity was decreased at low pH (high acidity). Because polysaccharide ; CMC, could be hydrolyzed by acid.

The increase in viscosity of CMC solution was directly proportional to change in CMC concentration.