Chapter V

Conclusions

Sodium carboxymethyl starches from three native starches, glutinous rice starch, rice starch, tapioca starch were prepare to have DS of 0.16 (MGS), 0.26 (MRS) and 0.38 (MTS), respectively. The method of modification was based on Filbert (1992) were successfully prepared by using the same condition with Filbert's method. But for MTS with DS of 0.38 the reaction time needed to reduce from two hours to 90 minutes.

Property of synthesized modified starches and Ultrasperse®2000 (UT) was evaluated as follows;

- UT was easily dispersed in water more than other synthesized modified starches.
- The viscosity of each suspending agent was increased when increasing the concentration of modified starches and the results were clearly indicated that MGS, MRS and MTS possessed higher viscosity than UT. Furthermore, the viscosity of modified starch is could be ranked from low to high viscosity as followed; MGS > MRS > MTS > UT.
- The rheology study revealed that the MGS, MRS, MTS and UT exhibited pseudoplastic material with thixotropic value and could be used as suspending agent. MGS had excellent property as suspending agent than the other modified starches.

The optimum concentration of each modified starch and UT dispersions for used as suspending agent in calcium carbonate suspension was studied. MGS, MRS, MTS and UT dispersions at concentration of 1.0 %, 2.0 %, 3.0 % and 4.0 %w/v, respectively were selected for future study in model dry syrups.

The effect of buffer at concentrations of 0, 0.05, 0.10, and 0.20 molar, respectively on drugs content and viscosity of model dry syrup was studies. The selection of citrate buffer concentration was considered from important stability of

drugs in model dry syrups when kept at room temperature and in refrigerator (8.0 ± 1°C) for 14 days. The viscosity of each modified starch (MGS, MRS and MTS) and Ultrasperse®2000 (UT) dispersions were decreased in accordance with the increasing of buffer concentration used. Therefore, the lowest buffer concentration required for s amoxicillin trihydrate and cephalexin monohydrate was 0.05 molar at pH 6.0 and 4.5, respectively because it's provided drugs stability in room temperature and in refrigerator (8.0 ± 1°C) for 14 days.

Formulation of model dry syrups was design in order to obtain the suitable concentration of each suspending agent with excellent in optimum viscosity approximately at 200-600 cps. It was found that, in amoxicillin trihydrate dry syrup, MGS, MRS, MTS and UT at concentration of 2.5 %, 3.0 %, 3.0 % and 4.0 % w/v, respectively, could maintain the viscosity of formulation as required. Suitable concentration of MGS, MRS, MTS and UT in cephalexin monohydrate dry syrup was found to be 2.5 %, 2.5 %, 3.0 % and 4.0% w/v, respectively. However, MTS gave gas bubble when shaking including the high water content in formulation. Furthermore, suspending agent as using MGS, MRS and UT in preliminary model dry syrup was selected.

In addition, the stability of the selected amoxicillin trihydrate dry syrup and cephalexin monohydrate dry syrup stored at room temperature and45 °C with 75 % relative humidity (RH) for four months were investigated. The results showed that model dry syrups were stable under observations of physical stability such as appearance of powder and suspension, pH, shot reconstitution time, water content and good redispersibility but viscosity and drug content were slightly changed.