

CHAPTER 4

Conclusions

In this study, we modified four native starches, including corn starch, glutinous rice starch, rice starch, and tapioca starch by substitution reaction and have obtained three different degrees of substitution of modified starches from each type. We then evaluated these modified starches for their suspending property in comparison with six commercial suspending agent. The following conclusions can be drawn from the study;

1. The procedures according to Filbert (1952) did not yield the modified starch with expected degree of substitution. In order to obtain the desired DS, we have modified the procedure for each DS in the following manner; Filbert's procedure for 0.23 was employed to prepared MCS 0.13, MGS 0.16, MRS 0.15, and MTS 0.13, Filbert's procedure for 0.34 was used to prepare MCS 0.26, MGS 0.26, MRS 0.26, and MTS 0.20, by reducing the reaction time from 120 minutes to 20 minutes, and Filbert's procedure for 0.34 was used to prepare MCS 0.39, MGS 0.39, MRS 0.39, and MTS 0.38. In all preparations, NaOH should be added slowly into the reaction and the start timing when the required temperature has been reached.

2. From the preliminary study, modified glutinous rice starch (MGS), modified rice starch (MRS), and modified tapioca starch (MTS) with DS of 0.16, 0.26, and 0.38,

respectively, were selected. These modified starches exhibited good results on viscosity, sedimentation volume, and redispersibility. All three DS of modified corn starch (MCS) displayed poor results in these evaluations and was excluded from the study.

3. In ibuprofen suspension, the results clearly showed that MTS and MRS containing suspensions possessed higher viscosity, better redispersibility, and superior sedimentation volume compared to those contained AC, AV, TG, and SA, at any concentration. At low concentration used in the study (1%), MRS and MTS also exhibited better suspending property than SCMC and were comparable to XG. In contrast, MGS reacted with Tween^R 80 in suspension formulation and resulted in precipitation of the contents. The use of MGS as suspending agent is not recommended unless the incompatibility is eliminated.

4. Dispersion of MRS, MTS, and MGS showed similar thixotropic quantity to that of SCMC and SA. The values were much higher than that of AC, AV. Thixotropy is a preferred characteristic of suspension and the quantity of thixotropy can be employed as a indication of good suspending agent.

5. MRS containing suspension showed similar results when evaluated in both normal and freeze-thaw condition indicating that MRS was able to withstand and maintain its stability under stress condition.

6. Ibuprofen suspensions that contained MTS and MRS displayed a good uniformity of ibuprofen dispersion during storage over the period of 12 weeks. The results were similar to those obtained from suspensions that contained XG and SCMC. In addition, the suspensions prepared from both modified starches exhibited good appearances, homogeneity, and had no incompatibility with other ingredients.

The results have suggested the use of MTS and MRS as suspending agent and the application of these modified starch in the industrial scale should be considered.



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