CONCLUSIONS

The controlled release of the DTZ HCl pellets capsule could be prepared by coating DTZ HCl pellets with an appropriate amount of ethylcellulose using a Wurster column process. The DTZ HCl core pellets were prepared by using extrusion and spheronization processes at suitable conditions and formulation.

Beside spheronizer speed, spheronization time, binder type, binder concentration and amount of water all affects the appearance and physical properties of prepared pellets, the properties of active drug such as the high water solubility and its binding property had an influence on the spheronization process too. It needs an appropriate adjustment of the composition of the formulation to give the desired characteristic of the core pellets.

In this study, the method for evaluating the sphericity of core pellets for selection of the formulation that give the most sphere pellets by calculation of the parameter from image analysis is trustworthy since it agrees with the results from the photomicrograph. However, the selection of the more sensitive types of shape parameter that can distinguish the little different spherical shape is an important factor for evaluation.

Plasticizers were used for the development of the mechanical properties of the film. In this study, free films can be used as simulated film in evaluation of plasticizers effect on mechanical properties. The selection of film formulation by using mechanical properties of free film is possible, but it needs the results of actual application for final decision. However, it is a good method for preliminary evaluation.

In the dissolution study, It was found that the release of drug from film-coated DTZ HCl pellets decrease with an increasing amount of EC. The initial loading dose is necessary for adjusting the release characteristic of prepared DTZ HCl pellets for excluding the lag time period. The formulation that gave the insignificantly different release profile when compared to commercial products (Herbesser® 90 SR) is the mixture of coated pellets and uncoated pellets at a ratio of 4:1. The term of coated pellets represented the pellets that were coated with plasticized EC film by 20 % TEC weight on dry polymer at 7.5 % w/w coating level.

In this study, the release characteristics of DTZ HCl coated pellets were also considered. The results exhibited that the release profiles of prepared DTZ HCl coated pellets composed of three phases. Those were lag time period, constant release period which followed zero-order release, and finally, declining rate period. However, at high drug concentration (90 mg/150 mg) the zero-order release was prolonged and the plateau region could not be observed in the experimental time period. It was found that the lag time and constant release rate period were in the employing sampling time.

The release mechanism of prepared DTZ HCl pellets was found to compose of two major parts. In lag time period, a solution/diffusion through the polymer membrane was considered. The osmotic driving force was generated by DTZ HCl, since its high water solubility made it act as an osmotic inducing agent and, accompanied by the driving force from swelling of Avicel® PH 101, could probably be part of the reason for the release of DTZ HCl after lag time. The release rate of DTZ HCl from pellets are found from the fundamental equation of both mechanisms.