CHAPTER I

INTRODUCTION

Clindamycin has been used as a successful topical agent against acne vulgaris for many years (Thomsen, et al., 1980; Beacker, et al., 1981). Stability studies indicated that clindamycin has shown maximum stability at pH 3-5 (Oesterling, 1970). The major degradation pathway of clindamycin was hydrolysis. One way to avoid this problem is to limit access of the drug to water by addition of nonaqueous solvents such as alcohol, propylene glycol or glycerine (Connors, 1986). There is only one clindamycin product in Thailand that is available in a solution dosage form. This product is 1% clindamycin phosphate in a solvent mixture of 50% isopropyl alcohol, propylene glycol and water which is known as Dalacin T(R). No other dermatological dosage forms of clindamycin are formulated and studied in the stability point of veiw.

Several methods are available to stabilize a drug which is susceptible to acid-base catalysed hydrolysis. The usual method is to determine the pH of maximum stability from kinetic experiments at a range of pH values and to formulate the product at this pH (Martin, 1993). A dosage form of which ingredients are similar to the solution is gel. It is adjusted to the desired pH by using a buffer system which is easier than other semisolid dosage forms. Gel is an interesting dosage form for pharmaceutical and cosmetic products because it is an elegant dosage form and releases medicament easily (Babar, 1990; 1991). It was expected that the buffered gel dosage form can improve the stability of this drug.

The feasibility of making a new preparation of any drugs must be evaluated. The evaluation of a semisolid dosage form consists of the study of drug release from its base and chemical and physical stability tests. The stability tests are often performed under exaggerated condition to accelerate the degradation process. Arrhenius method is the most well-known accelerated

test. However, higher temperatures cause an alteration of gel-physical property. When the physical property changes, it becomes increasingly difficult to make an accurate chemical stability prediction at ambient condition (Carstensen, 1984). In this work, the accelerated stability test of a gel dosage form was performed at 40°C, 80% RH according to Joel-Davis condition (Carstensen, 1990).

In summary, the objectives of this study were to:

1. Formulate clindamycin hydrochloride gel.

2. Study the physical and chemical stability of clindamycin hydrochloride gel at ambient temperature, accelerated condition and after passing eight Freeze-Thaw cycles.

3. Study the release of drug from gel bases by using the various kinds of synthetic membranes and receiving media.

Results obtained from this investigation should bring about the stabilized clindamycin hydrochloride gel and the suitable systems to study the release of drug from gel bases.