# CHAPTER I

# INTRODUCTION

Nonsteroidal anti-inflammatory drug (NSAID) gels, including ketoprofen (KP) gel, are popularly used in hospitals. KP is a potent NSAID widely used in the treatment of rheumatoid arthritis and other related conditions. The oral administration of this drug carries the risk of gastric irritation and undesirable systemic side effects. To avoid these problems, KP applied directly onto the inflamed site would be advantageous because the drug is delivered directly to the disease site allowing for high local drug concentration (1,2).

Gels, or jellies, are semisolid systems consisting of suspensions made up of small inorganic particles or large organic molecules interpenetrated by a liquid. Some gels are transparent but some are translucent depending on their composition. The advantages of gels are sparkle, water washable, water soluble, and greaseless. Gels can be used in many routes of administration such as orally, topically, intranasally, vaginally, and rectally (1,2,3,4).

In the formulation of topical preparation, many critical criteria should be considered. For example, the physical appearance, the consumer's feeling, stability of the active ingredients, and the excipients in the formulation, the bioavailability of the drug, and its percutaneous absorption. Among these, the bioavailability of the drug is the most critical and the vehicle choice also plays an important role. The permeation of drug through skin should also be considered because the barrier property of the skin.

In this study, the effects of gelling agents and some additives on *in vitro* permeation of KP from KP gels were studied. The skin permeation of KP was evaluated by using modified Franz® diffusion cell. Wistar rat skin was used as a skin model.

The objectives of this study are

1. To study the type and concentration of gelling agents affecting the permeation of KP gel through the rat skin.
2. To study the influence of some additives affecting the permeation of KP gel through the rat skin.
3. To study the stability of KP gels under heating and cooling cycles and room temperature for six months.