CHAPTER I

INTRODUCTION

Liposomes are vesicles consist of two parts. The inner part is aqueous solution which is covered with lipid , especially phospholipid, which is the outer part. Preparing liposomes begins with the dispersion of lipid in water. They can entrap many substances, hydrophobic substances incorporated in the bilayer membranes while hydrophilic ones incorporated in the inner part and amphiphilic ones incorporated in two parts of liposomes. Beside this, liposomes can be used as drug carriers into the target skin and decrease side effect.

There are many methods used for preparing liposomes such as mechanical dispersion method, solvent dispersion method and detergent solubilization method. Mechanical dispersion method is suitable to prepare liposomes containing lipophilic drugs in laboratory because it is simple and the outcome product is multilamellar liposomes. These vesicles which have various bilayer membranes in which entrap lipophilic drug molecules and drug entrapment efficiency can be arise up to 100% (New, 1990a).

Factors affecting the preparation of liposomes are properties of drugs, lipid such as cholesterol and charged lipid such as stearylamine. Moreover, molar ratio of lipid used for preparing liposomes such as lecithin to drug molar ratio and lecithin to cholesterol molar ratio also affect the liposomal preparation (Kulkarni, Betageri and Singh, 1995).

However, the stability of liposomes on the storage is a major problem. There may be fusion, leakage of liposomes including degradation of lipid used. These can be solved by addition of a charged lipid and an antioxidant for prevention of fusion and degradation of lipid causing leakage of liposomes, respectively (Weiner, Martin, and Riaz, 1989; New, 1990g).

Ibuprofen is a non-steroidal antiinflammatory drug. Its pharmaceutical effects are antiinflammatory actions, antipyretic, analgesic such as dysmenorrhoea, migraine, post-operation, rheumatitis and muscle sprains. However, ibuprofen has a short half-life, one or two hours, and gastro-intestinal effect like other drugs in this groups. Thus, developing topical dosage form for ibuprofen may solve these problems.

The purposes of this research are

1. To prepare ibuprofen liposomes by mechanical dispersion method.

2. To study the factors affecting the preparation of ibuprofen liposomes such as soybean lecithin to drug molar ratios, soybean lecithin to cholesterol molar ratios, addition of positively charged substance, stearylamine and addition of an antioxidant, (±)-α-tocopherol.

3. To investigate liposomes entrapment efficiency and characterize physical properties such as size and size distribution via laser scattering method and liposomes characteristics via scanning electron microscopy and transmission electron microscopy.

4. To investigate the stability of ibuprofen liposomes when freshly prepared and after storage at 4°C for 1 month evaluated from their properties such as the percentage drug entrapment and physical properties such as size and size distribution.