CHAPTER I
INTRODUCTION

In recent years, plasma treatments are used in many application especially, used to modify surface properties such as adhesivity, hydrophobicity, hydrophilicity, oleophobicity, wettability, printability and chemical structure morphology. (Hegemann et al., 2003) The mechanism is coating some substants on surface of materials for improve that properties and this method gives clean process eco-friendly, low temperature for operated and leaving bulk properties of materials are unchanged. (Wagner et al., 2003)

Nowadays, the main problem of environmental concerns about globle pollution in water is concerning about waste water such as heavy metals contamination (Hsu et al., 2011) and high BOD (Biological Oxygen Demand) from organic waste in water (Babu et al., 2006) thus, to solve this problem that will use some material for reducing its and reusing some organic waste to applied this material together in order that, decreasing waste, increasing properties and making valve of material and waste. One of the materials found to be promising was the waste shrimp shell from by-product of the seafood industry that is suitable for produce waste polymeric material

Because shrimp shell is the most common material, easily to found in almost countries, including Thailand has high capability for product shrimp frozen seafood for export around the world and it consists of chitin, poly β-(1-4)-N-acetyl-D-glucosamine, is a major structural component

Since poly β-(1-4)-N-acetyl glucosamine is also a monomeric unit in hyaluronic acid, an extracellular macromolecule that is important in wound repair and biomedical application, chitin should possess the characteristics favorable for promoting rapid dermal regeneration and accelerated wound healing suitable for applications extending from sample wound coverings to sophisticated artificial skin matrixes. Accordingly, chitin has been investigated in association with other materials depending on the wound healing effect sought.

The objective of this work is preparing chitin from waste shrimp shell by decalcification and deproteinization and next step is fabricating nylon/chitin

membranes by two different ways which were solution casting and surface coating. For solution casting method, chitin and nylon 6,6 is separately dissolved in calcium chloride-saturated methanol solvent before mixing together at different mixings ratios. The membranes were casting and drying in air and then washing with distilled water to remove the calcium salt, drying in oven for two days and membranes were entering to DBD treatment. For surface coating method, chitin was dissolved in calcium chloride-saturated methanol and then was coated on DBD plasma-treated on nylon mesh surface. The concentrations of chitin were varied to be 0.5%, 1%, and 2% After that DBD-plasma treatment the membranes from two different methods were characterized morphology, physical, chemical and mechanical properties by scanning electron microscopy (SEM), Fourier transformed infrared spectroscopy (FTIR) , water contact angle , thermal gravitation analysis (TGA) , universal testing machine (Lloyd), X-ray diffraction(XRD) , biocompatibility test by using human fibroblast cells