

CHAPTER 1: INTRODUCTION

1.1 Background

In modern today world, development of microtechnology growing rapidly in last few decades which affecting many aspects of industry, including textile industry to produce more functional product. One of the applied micro technology product are microfibres and nanofibers which vary in the range of 100 – 500 nm and 10 – 100 nm respectively [1]. The advantages of the fibres are such as wide surface area, permeable structures, and high elastic modulus, even nanofibres reported effectively applied in medic, filtration, protective fabrics and etc. The use of fibre was limited due to characteristic qualities in the natural world, resulting in the development of manufactured fibres only started a century ago.

Electric charge to produce small particle has been known and studied for over a century, but flow rate and time-taking limitation constrained usage of electric charge in commercialization, either by electrospraying, which atomize low viscosity fluid into droplets or electrospinning, which produced filaments from viscoelastic liquids [2].

Electrospinning is a spinning technique with a unique approach using electrostatic forces to produce fine fibres from polymer solutions or melts. Produced fibres by electrospinning have a thinner diameter (from nanometer to micrometer) and a larger surface area than those obtained with conventional spinning processes [3]. Many synthetic and natural polymers, including single and blended polymers, have been electrospun into fibres that can be employed in a variety of applications, such as filtration and thermal insulation, and in the manufacture of protective clothing, sensors, conducting devices, wound dressings and scaffolds for tissue.

Binahong (*Anredera Cordifolia*) is a famous herbal in traditional treatment. The chemical content of Binahong leaves is such oleanolic acid, antimicrobial, ascorbic acid, saponin, triterpenoid flavonoid, and protein [4]. Binahong leaves also have anti-inflammatory, anti-fever and anti-parasitic effects cause of the content that it has. This can be an alternative treatment, as the providon iodine 10% only has antiseptic but not inflammatory [4]. As for those, in this research, fibres are produced by using electrospinning. Binahong Polymer is used as fibre material,

with varying the distance of drum and spinnerette, to find the best distance for the electrospun products.

1.2 Aim and Objectives

The objectives of this final project is to settings electrospinning machine, obtain Binahong polymers, and electrospinning product based on varied distance between the drum and spinnerette, voltage and viscosity.

1.3 Benefits

The benefits gained in this final project is to get the electrospin Binahong fibre product.

1.4 Problem Boundary

The polymer material used in this project is polyvinyl alcohol. Needle used is 22G x 1 ½". The research is examined in laboratory environments. The behavior of fibre diameter due to the parameters variation will be studied.

1.5 Outline of Report

Generally, the systematical of writing consists of four parts. The first chapter is an introduction. It explains about the background, problem formulation, objectives, benefits, problem boundary, and systematical of writing of the report. The second chapter is a literature review. It concerns about theory related to research that will be conducted. The third chapter is a methodology. It contains tools, materials, and the procedure in conducting this research. The fourth chapter are data and discussion, contains result and analysis data. The fifth chapter is conclusions and recommendations, talking about summary and possibilities for further research. The last is a Bibliography