

UNIVERSITI TEKNOLOGI MARA

**EQUILIBRIUM STUDIES ON ADSORPTION OF
BOVINE SERUM ALBUMIN (BSA) USING PVDF
MEMBRANE (IMMOBILON PSQ)**

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CHAPTER I

INTRODUCTION

1.1 OVERVIEW

A membrane is a selective barrier that allow molecules, ions, or other small particles to pass through it. Membrane can be classified into two types which are either biological membrane or synthetic membrane. Biological membrane is a selectively permeable barrier consist of phospholipid bilayer that can be found within living things while synthetic membrane is made by human for the separation purposes in either laboratory or industry. Ceramic membranes and polymeric membranes are two types of synthetic membrane that are widely used in the industry. The most commercially utilized synthetic membrane are made of polymeric structure that is used in waste water treatment process, production of drinking water by reverse osmosis, gas separation and also in biomedical application [1]. For biomedical industry, the application of these polymeric can be seen through the hemodialysis process and diagnostic kit. Biosensor, dot-blot and western-blot are examples of the technique used for diagnostic kit in order to detect certain diseases based on the adsorbed protein. Polymeric membrane become compatible tools to analyze enzyme or protein due to their relative low cost, rapid response and unique feature. Commonly, polyvinylidene fluoride (PVDF), nitrocellulose and nylon membranes are used in designing biosensor. Out of the three type of membrane, the capability of PVDF membrane to retent more protein as compare to other membrane is the speciality of PVDF membrane. In order to compete with nitrocellulose and nylon membrane that had been used for years in designing biosensor because of their excellent performance in chemical modification and

binding of specific protein, a study on the capability and characteristic of PVDF membrane [2] to adsorb protein have been done by doing a polymorph analysis, morphology analysis and also study on adsorption isotherm. Since the development of biosensor is based on the adsorption mechanism, an understanding on adsorption isotherm is important to indicate the amount of protein bind to the PVDF membrane once the adsorption process reaches an equilibrium state [3]. This is because the performance of the membrane depends on its ability to adsorb specific protein for the use of biosensor. Based on the previous study, the characteristic of PVDF membrane based on morphology and polymorph that also affect the amount of protein bind to membrane need to be understood [4].