

UNIVERSITI TEKNOLOGI MARA

**EFFECT OF POROUS POLYSULFONE MEMBRANE'S
THICKNESS ON FLUX OF FERUM IONS**

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ABSTRACT

Polysulfone membrane has been widely used in removal of heavy metal from wastewater. In this research, the wastewater from electroplating industrial was used which contain high ferum ion. The existing method still need to overcome limitations of high cost film and high polymer dosage. Therefore, this work, the integrated complexation method through the use of a composite membrane with hybrid membrane as thin layer and composite membrane with polymer blended of PVA/chitosan as thin layer were developed, where the thickness of polysulfone (porous support) was varied at 60 μm and 90 μm . The experiment was carried out at pressure 14 bar and pH solution was altered to pH 7. The results show that composite membrane with hybrid membrane as thin layer has better performance in percentage removal of ferum ion regardless of the polysulfone thickness.

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CHAPTER I

INTRODUCTION

1.1 RESEARCH BACKGROUND

Hybrid membrane has good mechanical and thermal properties as compared to membrane from pure polymer [1] and it is actually combination of at least two different polymer materials [2]. Method of phase inversion has been practiced in this study to form a polysulfone in solid phase. It is a process which the liquid or soluble state will change into solid state [3]. In this case, the polysulfone in crystal form was supply under high temperature until it melted. The high viscosity of polysulfone will eventually turn into solid after being soaked in water which the formation of solid is actually polysulfone membrane.

While Chitosan acts as biopolymer which composed of abundant natural polymer that is chitin [4]. Chitosan has been claimed as unique because it is also has a properties as chelating agent to form metal complexes [5] [6]. The properties of chitosan that consist of hydroxyl and amino groups help to absorb various organic compound effectively [7]. However, chitosan also have the weakness of poor mechanical stability and biodegradability [1].

The used of thin film composite membrane which represent the integrated complexation method could overcome limitation of polymer which could enhanced ultrafiltration process. The integrated complexation method was introduced which to remove heavy metal effectively. This method produced thin film composite that consists of hybrid membrane and polymer blend of PVA/Chitosan as the barrier layer. The purposes of coating thin layer with polymer blend or hybrid membrane on is to