

**THERMO OSMOTIC EFFECT OF ELECTROSPUN PVDF
MEMBRANE**

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ABSTRACT

The effect of thermo osmosis is critical to the osmosis based renewable energy harvesting. Using this technique the fluid is forced into another reservoir by using the osmosis effect, temperature gradient and pressure exerted to produce energy. In this study, we using the osmosis effect enhance by the temperature gradient to study the dynamics of fluid across the membranes for heat harvesting energy with different porosity. The materials that have been used to create the membranes are polyvinylidene fluoride (PVDF) because it has high thermal resistivity, high chemical resistance and good mechanical properties. Electrospinning machine was used to create the membranes with different porosity needed. The previous study show electrospinning machine will creates a beta phase of PVDF electro spun. From the experiment, sample of 10V shows higher efficiency in the dynamic of fluid pass through the membrane which is 0.009 m^3 change in volume with $1.9485 \times 10^{-5} \text{ N}$ of the osmotic pressure. This is because the formation of beads a less compared to 14V and 18V where beads almost in every topology of membranes. The formation of fibers in the samples of 10V, 14V and 18V are well distributed by using electrospinning machine and we can see the porosity increased as the voltage increase.

CHAPTER 1

INTRODUCTION

1.1 Background of the study

Osmosis is a passive transport which requires no energy to be applied that relates to the flow of fluid from high concentration solvent to low concentration solvent across the semi permeable membrane. The mechanism is shown in Figure 1. It occurs because of the concentration gradient between two reservoirs making the effect to occur to balance in between the two regions.

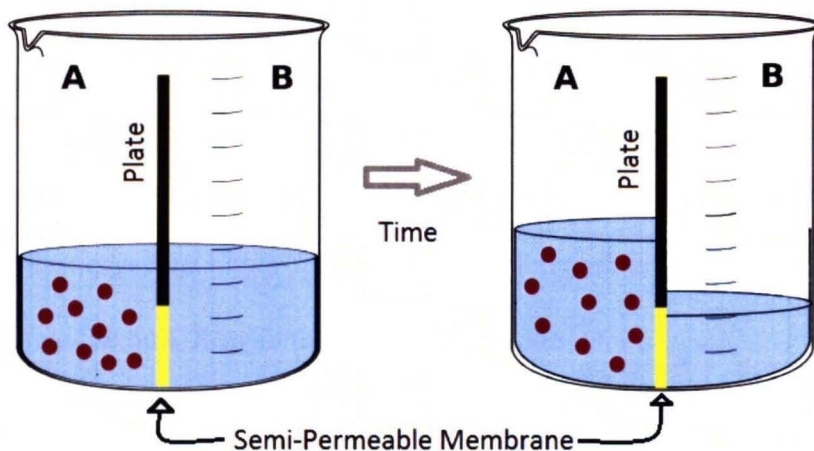


Figure 1: Osmosis effect