CHAPTER I
INTRODUCTION

Since the industrial revolution in 1850s began, industrial processes, mainly from the combustion of fossil fuels, have caused emissions of greenhouse gas. The most important gas is carbon dioxide (CO_2) which is one of the most important greenhouse gases that caused global warming. One of the interesting technologies that can reduce CO_2 emission is ***CO_2 capture*** via ***post - combustion***. Nowadays, the most well-known CO_2 capture technology is amine absorption, but amine solutions still have some problems associated such as solvent degradation and corrosion. Therefore, alternative methods have been developed, for example ***adsorption process.***

In adsorption process, molecules of CO_2 are adsorbed onto a surface of adsorbent. Adsorption efficiency can be increased with surface area of the adsorbent Polymer obtained from high internal phase emulsion or "polyHIPE" is focused because it contains many advantages i.e. very high surface area and flexible facilitating a design needed. In addition, adsorption efficiency can be also increased by amine functional groups on the adsorbent. Polyethyleneimine (PEI) is one of the polymers containing amine functional group in the structure that can be used to capture CO_2. However, most PEI adsorbents have been prepared by impregnation into porous material, which PEI can plug the pore. Furthermore, interaction between PEI and the adsorbent surface is low, so PEI can be loss during being regenerated.

In this study, PEI was added into polyHIPE directly during polymerization reaction to gain advantages, such as maintain high surface area and effective amine functional group of PEI.