CHAPTER I
INTRODUCTION

Global warming is the increasing in the average temperature of earth near the air and ocean surface. It caused by increasing concentration of green house gases; carbon dioxide methane and nitrous oxide, resulting from human activity; such as fossil fuel combustion by industrial activities and gasification processes. Therefore, it is very important to design adsorbent materials that would adsorb such gases before being liberated into the environment. Polymerization of the monomeric continuous phase of a high internal phase emulsions (HIPEs) prepared highly porous crosslinked polymer materials. The monomer system which has received the most attention in PolyHIPEs studies is styrene/divinylbenzene (DVB). A lot of effort was invested to determine the factors which affect the cellular structure and cell size of the resulting porous polymers, and in 1997, Neil R. C. *et al.* have described the production of PolyHIPEs materials with high internal surface areas, employing methodologies similar to those used in porous polymer bead preparation. Scanning electron microscopy (SEM) can clearly see the foam-like morphology of open-cellular PolyHIPEs materials (Figure 1).

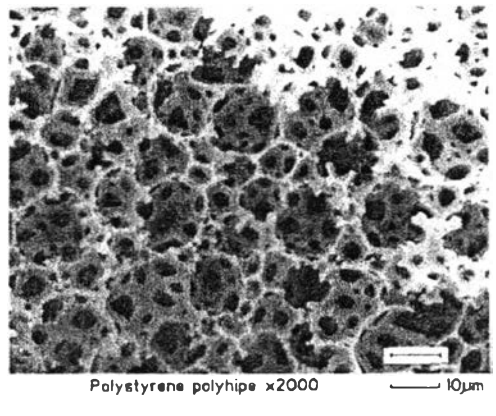

Figure 1. Scanning electron micrograph(SEM) of poly(styrene/DVB) PolyHIPEs.

The open-cell polymers are characterized by an extremely low dry bulk density, less than 0.1 g cm^{-3}, which is due to complete interconnection between all

neighboring cells. Their mechanical properties are similar to gas-blown polystyrene foams, although the smaller cell sizes and higher degree of cellular spherical symmetry of the emulsion-derived foams produces higher compressive strengths. However the inherent brittleness of polystyrene and the characteristic low density of PolyHIPEs polymers, monolithic materials derived from styrene/DVB tend to fragment into particles rather easily under mechanical stress. Moreover, they possess lower thermooxidative stability and lower selective property than Polysulfone. For this reason, investigations into the production of a more thermally stable and more selectivity material, involving a high-performance polymer such as polysulfone, will be entried out.

The purpose of this work is to produce maleimide-terminated poly(arylene ether sulfone) PolyHIPEs, using mixed surfactants system that contains SPAN80, DDBSs, and CTAB, determine the suitable condition and amounts of a surfactant for use as a carbon dioxide adsorbant of the obtained PolyHIPEs.