CHAPTER V
CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

The spherical polyHIPE with the void and fracture surface was synthesized from water in oil in water (w/o/w) emulsion by varying the quantity of oil soluble surfactant to water soluble surfactant in the ratio range of 0.72- 4.00. The addition of hexylamine slightly shifted the spherical formation with void and fracture condition of polyHIPE reference to obtain the highest surface area of polyHIPE-hexylamine. The amine loading by high internal phase emulsion polymerization showed that there was no decrease in surface area or pore plugging, which was considered to be the advantage of the method. For the addition of 1,3-diaminopropane into polyHIPE, it was found that the spherical forming more difficult than hexylamine adding because it have 2 amino groups in the chemical structure which trend to create the bigger molecules and more polarity. The CO_2 adsorption capacity of polyHIPE-1,3-diaminopropane is the highest value when compared with polyHIPE reference and polyHIPE-hexylamine. The moisture affects to decrease the CO_2 adsorption capacity.

5.2 Recommendations

Due to the fact that the synthesized polyHIPE in this research used oil soluble surfactant (SpanR80) and water soluble surfactant (Triton x-100) which affect to the morphology , spherical forming and directly change with the surface area to get the higher surface area, a type of surfactant should be varied based on HLB value.

The amine loading affect directly to CO_2 adsorption capacity of polyHIPE, so the increase of amine loading by increasing the VBC and amine composition should increase the CO_2 adsorption capacity.

Most of amines are hydrophilic, so it will better react with hydrophilic monomer in an aqueous phase. It is suggested to change the system to water in oil emulsion polymerization and use monomers in aqueous phase.

From the CO_2 adsorption result, it was found that, polyHIPE-1,3-diaminopropane has the highest adsorption capacity, however, the effect of moisture has not studied yet.

The efficient polyHIPE-amine should be studied by the optimization between increasing surface area and increasing amine loading condition.