CHAPTER I
INTRODUCTION

The separation of CO_2 from CH_4 is important in natural gas processing because CO_2 reduces energy content of natural gas. In addition, CO_2 is acidic and corrosive in the presence of water within the transportation or storage system.

Possible processes for CO_2 separation include physical and chemical absorption, membrane separation, gas-solid absorption and cryogenic separation (Ding *et al.*, 2001). The use of carbon membranes for gas separation process is very interesting because it consumes lower energy, and it not affected by plasticization sffect unlike polymeric membrane. Moreover it provides better selectivity, thermal stability and chemical stability (Fuerters *et al.*, 1998) than those techniques already exist such as polymeric membrane and distillation.

Polybenzoxazine is one of the candidate materials used to make carbon membrane due to a wide varieties of available phenol and amine derivatives which offer great opportunities in molecular design (Agag *et al.*, 2009) to tailor effective pore structures for carbon membranes used for separation.

Polybenzoxazines also provide very good properties such as high heat resistance and flame retardance, excellent dimensional stability, low water absorption and good dielectric properties(Ning, 1994; Takeichi, 2005)

In this study, polybenzoxazines based carbon membrane for CO_2/CH_4 seperation was prepared by using aniline, bisphenol A and para-formaldehhyde (Lorjai *er al.*, 2009). The effect of carbon microstructure thermal treatment and acid treatment surface on gas separation efficiency was investigated.