

## CHAPTER VI

### CONCLUSIONS AND RECOMMENDATIONS

From the results of this thesis, we conclude that:

1. The activation energy of propylene polymerization is  $13.25 \pm 0.64$  kcal/mole.

2. General properties of the polypropylene made from polymerization with  $\text{rac-Et(Ind)}_2\text{ZrCl}_2/\text{MAO}$  catalyst system were ;

- Molecular weight 12,739-32,000 g/mole
- Molecular weight distribution ( $M_w/M_n$ ) 2.35-2.76
- Isotacticity 92.1-98.6 %
- Crystallinity 52-66 %
- Melting point 131.1-150.3 °C

3. Activity of catalyst increased with increasing temperature and slightly increased with increasing zirconium and aluminium concentrations, Al:Zr ratio and monomer concentration.

4. Molecular weight increased with decreasing polymerization temperature and slightly increased with decreasing zirconium and aluminium concentrations.

5.  $M_w/M_n$  ratio decreased with decreasing polymerization temperature and increasing Al:Zr ratio.

6. Isotacticity, crystallinity, and melting point all increased with decreasing polymerization temperature and increasing Al:Zr ratio.

After the system protection is improved from outside atmosphere which contaminates the catalyst system by using oxygen trap and molecular sieve with gas lines, the future investigation may turn the attention to the other catalysts which have different size and type of sandwich structure, or monomer gases.