CHAPTER V
CONCLUSIONS

From the results discussed in the previous section, it can be concluded that:

1. The amount of LMWPE produced in slurry polymerization semibatch reactor was in the range of 0.06-0.34 % by weight of HDPE produced which is lower than the commercial plants (because of the seperation method).
2. The amount of LMWPE was increased by 60 % when operating at low stirring speed because of non-uniform temperature in the reactor.
3. The higher the H_2/C_2H_4 ratio, the lower the molecular weight of HDPE resulting in an increase in the amount of LMWPE produced.
4. The observed activation energies of HDPE and LMWPE were 3.5 and 20 kcal/mole respectively. It can be concluded that HDPE and LMWPE are formed from different active sites.
5. The Al/Ti ratio and polymerization time seem not to affect significantly the amount of LMWPE produced (10-20 % change).

6. Below 80 ^{o}C, the relationship between the amount of LMWPE produced and the molecular weight of HDPE can be expressed by the following equation:

$$\log (Y) = 11.8451\text{-}2.6739 \log (X)$$

where Y = the amount of LMWPE produced (% by wt. of HDPE produced);

X = molecular weight of HDPE.