CHAPTER V
CONCLUSIONS

Porous polyethylene films were prepared from LDPE/starch blends by acidic hydrolysis and enzymatic hydrolysis. The formation of a porous structure essentially depends on the amount of starch removed from the film matrix. Starch particles were most effectively removed using dilute HNO_3. The reduction in starch content increased with increasing HNO_3 concentration. The starch particles were most effectively hydrolyzed at temperatures within the gelatinization temperature range of tapioca starch. As the starch content increased from 0 wt% to 12 wt%, the microstructure of the film changed from dense, nonporous structure to porous structure. An increase in the film thickness resulted in a decrease in starch removal. The measurement of weight loss due to starch reduction correlated well with SEM micrographs.

The mechanical properties of the film were found to decrease slightly after acidic and enzymatic hydrolysis. This was due mainly to the formation of voids in the film. The gas permeabilities and selectivity of the porous film increased significantly after hydrolysis. The porous film prepared has good potential for industrial gas separation of N_2, CO_2, and C_2H_4 from C_3H_8 and C_3H_6.