

CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

The ethylene epoxidation performance under the parallel plate DBD system with a upper rough glass plate coated with 0.1% Ag catalyst calcined at different temperatures was investigated. To determine the optimum conditions, an applied voltage, an input frequency, and a total feed flow rate were varied while other parameters, including an ethylene feed position and a gap distance were fixed at 0.5, and 0.7 cm respectively. The highest EO selectivity of 48.9% and the highest EO yield of 8.6% were achieved when used calcination temperature of 550 °C, an applied voltage of 19 kV, an input frequency of 500 Hz and a total feed flow rate of 50 cm³/min. Moreover, it was experimentally found that a used of N₂O as oxygen source provided better ethylene epoxidation performance than O₂ both sole plasma and catalytic plasma system.

5.2 Recommendations

In order to further enhance the ethylene epoxidation performance, other operating parameters, including ethylene feed position fraction, and gap distance should be examined for the optimum conditions under the parallel plate dielectric barrier discharge system. Moreover, other monometallic catalysts such as Cu, Pd, and Au should be investigated at their optimum loading.