

CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

The optimum condition that gave the highest ethylene oxide product for the DBD system with two dielectric rough-surfaced glass plates in the ethylene epoxidation reaction was determined by varying applied voltage from 13-25 kV and input frequency from 300-600 Hz. The highest ethylene oxide selectivity was 68.15 % and the power consumption to produce ethylene oxide was 2.76×10^{-16} Ws/molecule of EO produced that the DBD was operated at an applied voltage of 23 kV, an input frequency of 500 Hz, an O₂/C₂H₄ feed molar ratio of 0.2:1, and an ethylene feed position fraction of 0.5. Moreover, the highest ethylene oxide selectivity by using two rough-surfaced glasses was twice as much as that by using one smooth-surfaced glass.

5.2 Recommendations

The epoxidation performance might be enhanced by the Ag coating on two rough-surfaced glasses. All parameters including an applied voltage, an input frequency, an ethylene feed position fraction, and an O₂/C₂H₄ feed molar ratio should be varied to get new optimum condition for Ag on the glass plates under the parallel plate dielectric barrier discharge system.