CHAPTER V
CONCLUSIONS AND RECOMMEDATIONS

5.1 Conclusions

In this work, the ethylene oxidation under the plasma environment with and without TiO_2 was investigated. The ethylene was almost completely removed by the corona discharge. The ethylene efficiency increased with a higher applied power, but it was not affected by the frequency. The higher feed flow rate than 40 ml/min led to the drastic reduction of the ethylene conversion and CO_2 selectivity. In addition, the hydrocarbon by-products, methane and ethane, were formed, and their selectivity tended to increase with the flow rate. The UV light generated in the plasma can activate TiO_2, which, in turn, resulted in the increase of the CO_2 selectivity. However, the higher TiO_2 loading did not affect either conversion or selectivity due to the limitation of the light intensity from the plasma. As the gap distance increased, the ethylene conversion and CO_2 selectivity increased. The ethylene and the CO_2 selectivity increased with the gap distance because of more electrons consumed and active radicals produced. The increment of the CO_2 selectivity by TiO_2 corresponded to the change of the gap distance.

5.2 Recommendations

Another diluent gas as N_2 and Ar may be an alternative this study. The catalyst should be modified by loading a metal. The intensity of UV light generated measurement should also be studied.