CHAPTER V
CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

In the present study, the catalytic conversion of glycerol to propylene glycol over the CuZnO-based catalysts with different catalyst supports has been investigated. $CuZnO/Al_2O_3$ gave the highest catalytic activity followed by CuZnO/MgO, CuZnO/HT, CuZnO/ASA, respectively. This could be due to the largest surface area of $CuZnO/Al_2O_3$ and the basicity of the prepared catalysts which were obtained in the order of CuZnO/MgO > CuZnO/HT > CuZnO/ASA. Noticeably, CuZnO/MgO exhibited the highest performance in terms of stability. The effect of alkali (Na, K) addition in feed were investigated in CuZnO/MgO and $CuZnO/Al_2O_3$. The results showed that the refined glycerol exhibited higher conversion compared to the refined glycerol mixed with 0.1% Na or with 0.1% K feed in $CuZnO/Al_2O_3$. This could be because Na and K might deposit on the catalysts and poison the active site of catalysts. On the other hand, the refined glycerol mixed with 0.1% Na or with 0.1% K exhibited higher conversion compared to the refined glycerol feed in CuZnO/MgO. This could be because the Na and K hardly deposited on the catalysts and the higher pH value of the feed led to the more glycerol conversion and propylene glycol selectivity. The regenerated CuZnO/MgO catalyst gave the glycerol conversion as good as the fresh catalyst with higher selectivity to propylene glycol. This could be due to the larger CuO crystalline size and the higher surface area of the regenerated CuZnO/MgO catalyst, compared to the fresh catalyst.