CHAPTER VI

CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusions

1. Selection of suitable system components for the resolution of racemic menthol.

1.1 The suitable types of components in the reaction were lipase from *Candida cylindracea* as a catalyst, hexyl acetate as an acyl donor, and iso-octane as an organic solvent.

1.2 Iso-octane was exclusively chosen as a reaction media even though lower specific reaction rate than that of an aqueous/organic system (3:1 v/v). This was due to the more complex downstream separation process the latter system required owing to its stable emulsions formed.

2. The optimum conditions for resolution of racemic menthol by *Candida cylindracea* lipase in iso-octane were racemic menthol concentration = 73 mM, hexyl acetate concentration = 360 mM, temperature = 66 °C, and stirring speed = 110 rpm.

3. The mechanism of transesterification of racemic menthol with hexyl acetate using lipase from *Candida cylindracea* as a catalyst in iso-octane was the random bi bi type. The final conversion were 27.12% calculated base on racemic menthol, while the kinetic parameters were V_{max} = 100.28 μmol/hr-g.enz , αK_A = 33.92 mM , αK_B = 8.42 mM , K_A = 248.22 mM , K_B = 60.92 mM , K_{I1} = 51.19 mM , and K_{I2} = 481.98 mM which the specific reaction rate can be expressed as:

$$v = \frac{100.28[A][B]}{2066.4 + 8.42[A](1 + \frac{[A]}{481.98}) + 33.92[B](1 + \frac{[B]}{51.19}) + [A][B]} \quad \mu mol/hr\text{-}g.enz$$

6.2 Recommendations

1. This research studied the selective resolution of racemic menthol which the product of interest is a high optical purity menthyl acetate. Therefore, it should be interesting to determine the actual optical purity of the product achieved.

2. Experimental design is very useful for the determination of optimum conditions as well as for cost and time reduction in experimental work.