CHAPTER V

CONCLUSION

5.1 Conclusion

The experimental results showed the possibility for the production of activated carbon with well developed zinc removal, high specific surface area and high adsorption capacity from anthracite and palm-oil shell by zinc chloride activation. Experimental data showed that increases in temperature and time resulted in a better activation. The activated carbon from anthracite (0.80-0.90 mm) and palm-oil shell in medium size (1.18-2.23 mm) had the highest adsorption capacity and surface area .When the concentration of zinc chloride was excess, the adsorption capacity and the surface area decreased.

The optimum condition for the production of activated carbon from anthracite and palm-oil shell by zinc chloride activation in a fixed bed reactor was 15 g of anthracite (size of 0.80-0.90 mm) and palm-oil shell char (size of 1.18-2.36 mm) and soaked in 40 % zinc chloride solution. Then activation by passing nitrogen gas at 800°C for 3 hr. The resulting characteristics of activated carbon from anthracite were yield of 30.13 %, bulk density of 0.5879 g/cm^3, iodine number of 860.35 mg/g, methylene blue number of 583.03 mg/g, B.E.T.surface area of 1026.99 m^2/g and 0.20 % zinc deposition. The resulting characteristics of activated carbon from palm-oil shell were yield of 33.83, bulk density of 0.5063 g/cm^3, iodine number of 1069.10 mg/g, methylene blue number of 600.25 mg/g, B.E.T.surface of 1099.10 m^2/g and 0.20 % zinc deposition.

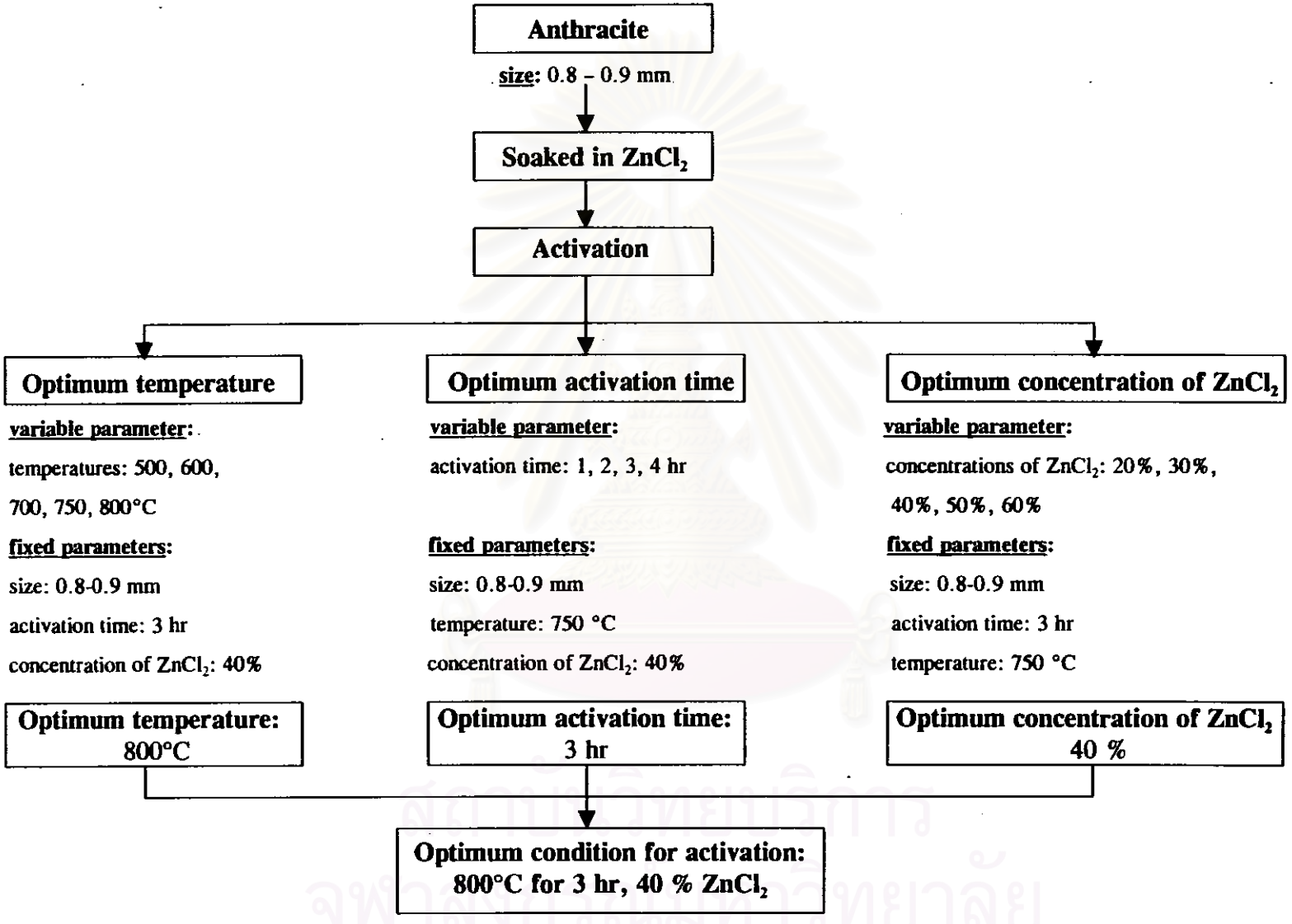

Figure 5.1 The optimum conditions of the production of activated carbon from anthracite by $ZnCl_2$ activation.

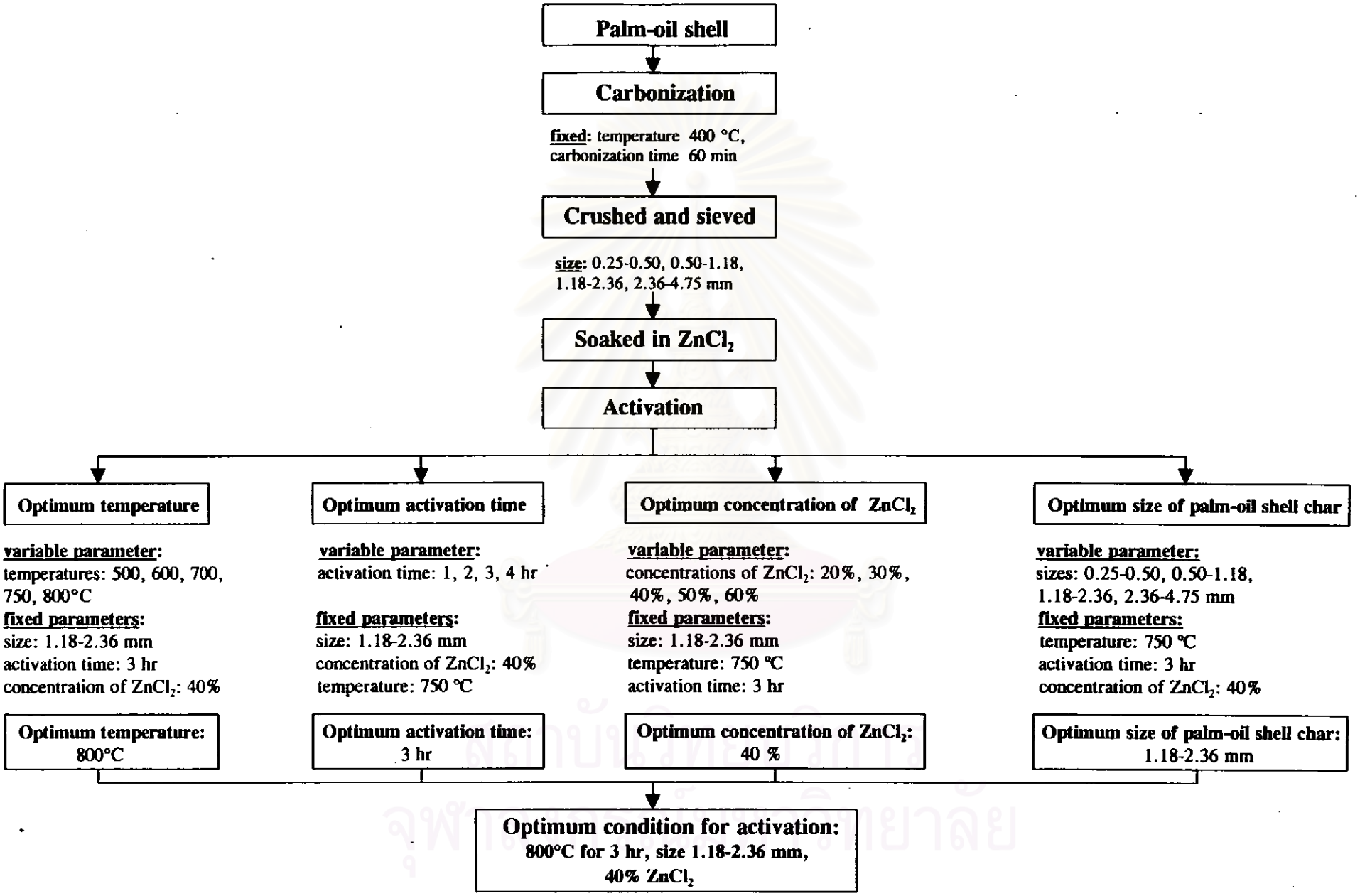

Figure 5.2 The optimum conditions of the production of activated carbon from palm-oil shell by $ZnCl_2$ activation.

5.2 Future works

1. Experiments on the various activating agents such as $CaCl_2$, $MgCl_2$, and some acids such as H_3PO_4, H_2SO_4.
2. Experiments on the removal of metal ions from aqueous solution by using activated carbon.
3. Investigation of residual metal after chemical activation on activated carbon.
4. Experiments on chemical activation using fluidization technique.