CHAPTER V
CONCLUSION AND RECOMMENDATION

5.1 Conclusion

This work proposed the modified Synheat model that allows non-isothermal mixing and several potential exchangers per branch stream for both HEN synthesis and retrofit problems. To execute nonlinearities in the MINLP model, it is also very helpful to specify an initial solution for searching feasible solution. Two effective steps, initialization and design steps, are proposed to solve simultaneous HENS problem. However, this proposed strategy cannot guarantee that the result is the global optimal one. The application and usefulness of the proposed model and strategy had been shown by two examples; one for synthesis and the other for retrofit.

For CDU case study, a retrofit model based on the stagewise superstructure, as proposed by Yee and Grossmann, is proposed. This model includes use of the existing area and purchase of new additional area. The stream splitting is allowed to increase the possibility of potential match, resulting in utility cost reduction. The systematic approach is applied to utilize the existing exchangers to save cost of new exchanger for HEN retrofit. From a case study, this work provides HEN retrofit design, having lower investment costs, and more practical and simple structure than the optimum network reported in the literature. The previous work introduced many splitting and used less existing exchangers than our work. Because of less utilities, their NPV is higher than this work.

5.2 Recommendation

For the future work, both synthesis and retrofit models should be validated with crude-preheat-train case study simulated by commercial simulation software; PROII.