

CHAPTER 7

CONCLUSIONS AND RECOMMENDATIONS

7.1 Conclusions

The computer program for heat exchanger network design using a conventional procedural programming technique is developed. In the preanalysis step, the program can determine the pinch temperature and minimum utility requirements by using the problem table algorithm. In the network invention step, the match patterns, systematically invented by Wongsri (1990) from heuristic rules and thermodynamic laws, are used as match operators to operate on process streams, i.e., they map one design state to another. The program can find network configurations that satisfy the design targets, i.e., minimum utility requirements and minimum number of units.

By using the procedural programming technique and the ranked match patterns, the program can find solutions rapidly. For a large problem, the program can find a larger number of configurations than the rule-based method since this technique is much more straight-forward and requires less memory to store information created during the search.

Five examples of standard HEN design problems are demonstrated. The program capability depends on the number and the type of match operators in the stack. The more number and type of match operators, the more difficult problem it can solve, i.e. the more powerful the program. There are some limitations of the program presented in this research. For example, it can not solve a problem which requires relaxation and the match

pattern operators for matching splitted hot stream with splitted cold stream do not exist in this work.

7.2 Recommendations

For the future work, a computer program for heat exchanger network design should include some other interesting features. The economic analysis or cost estimation should be added to help a user for further discriminate. The match pattern concept should also be extended to cover a case where heat capacities of process streams are not constant but varied in a piecewise or even in a continuous fashion.



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