Process modeling and energy integration of an industrial chemical plant  (A joint project with industry)

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Type: Master Project
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Duration: 6 months

Project Description and Motivation:

This study is a collaboration project between EPFL and a chemical industry in France including two main parts. The first part is the development of a process flow diagram (PFD) of the chemical unit and determination of material and energy balances, which requires a good knowledge and experience of simulation with Aspen. The second part is the definition of the heat requirement of the process and establishment of the composite curves following by calculation of the maximum energy recovery and statement of an ideal target based on the pinch method.

Objectives:

The goal of this project is two-folded. Firstly, to prepare PFD of the chemical site through simulation with an advanced chemical engineering tool (Aspen). Secondly, to realize a process integration analysis of the chemical site with the aim of targeting the minimum energy requirement of the process using pinch analysis.

Tasks:

- Reading process description of the unit and review available data sources and documents
- Data collection and process units analysis
- Simulation of the unit with Aspen
- Bibliography on Pinch analysis and process integration
- Definition of the heating and cooling requirement for the process units
- Calculation of the maximum heat recovery by pinch analysis
- Identification of penalizing heat exchangers
- Utility Integration
Requirements:

- Experience of flowsheeting with Aspen
- Chemical engineering knowledge
- Software: Matlab, Aspen
- Language: French and English
- Possibility of travel or short term stay in France (expenses will be covered)
- Signing the confidentiality agreement