Chemical Process Design / Diseño de Procesos Químicos

Memo III. Guidelines Memo III

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**Objective:** In MEMO 3, the design group has to size the equipment of the flowsheet you presented in MEMO 2, perform heat integration, and an economic evaluation.

**To-do list:**

1. Based on the mass and energy balance in MEMO 2, or a modification of it, include a complete calculation for the sizing and costing of every major piece of equipment. For minor or frequently-occurring, similar equipment such as heat exchangers and compressors, a single representative calculation is sufficient. **Each calculation must refer to specific equipment on the flowsheet and must represent the values**, which appear on the flowsheet.
2. Draw up an equipment list with the results of the calculations made: Size and cost of each individual piece of equipment.

3. Calculate the total equipment costs, capital cost estimation, manufacturing cost, and utility costs. Represent the results using pie charts.

4. Economic evaluation. Discounted and non-discounted criteria must be applied for the economic evaluation. You can use the following:
   - Capital investment.
   - Utilities summary.
   - Manufacturing cost.
   - Estimate of Annual Earnings and Return.
   - Net Present Value (NPV).
5. Perform a **sensitivity analysis on key parameters** (e.g., cost of raw materials, cost of energy, operating capacity, product price, interest rate).

6. Offer a **recommendation on the economic viability** of the process.

7. Preparation and delivery of Memo 3.
Memo 3 must contain:

- **Cover letter** (A clear, concise statement of essential findings and results (e.g. NPV, investment, operating costs), along with conclusions and recommendations. A single page should suffice).

- **Main Text** *(place figures and tables in appendix):*
  
  a) Sizing calculations with one detailed calculation for each type of equipment.
  b) Costing calculation with one detailed calculation for each type of equipment.
  c) Economic evaluation.
  d) Sensitivity analysis.
  e) Recommendation of economic viability.

- **References:** articles, patents, encyclopedias, web.

- **Appendix:** flowsheet and stream information table. Equipment list and cost. Other figures and tables