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1. Pectin Extraction Process

Extraction by acidic hydrolysis from peels of citrus fruits

- Batch operation with several tanks
- The pectin quality can be characterized by intrinsic viscosity (IV) and degree of esterification (%DE)
- Process conditions (Temperature and pH) and proportions of peel/solvent vary within a limited range which is known to result in a desired particular KPI profile

2. Objective and Motivation

From recipe-driven to a model-based approach

- Lean and robust operation
- Waste
- Time
- Capacity
- Product Quality

Development of monitoring strategy scheme

Knowledge-based decisions to reach target KPI’s

3. Dynamic Modelling

First principle model describing the non-linear process in respect to the KPI

4. Identified Problems

- Prediction of the desired KPI
- Flexible applicability over a wide operational range of T & pH
- Central role in model-based approaches
  - Process understanding
  - Troubleshooting
  - Monitoring
  - Continuous process optimization

Development based on fundamental physical phenomena and a parameter training set: ●Pilot scale ●T vs pH DoE ●one peel type

5. Monitoring Strategy

Flexible model scheme that copes with raw material discrepancies by providing better initialization parameters for each different peel that arrives at the process line

Combination of state-of-the-art state estimation algorithms together with chemometric techniques to provide the process operators with a decision making tool for process optimization

6. References