

Description of the M.Sc thesis in Electronics Engineering-Year 2005

Design of an H_∞ observer for rating temperatures and concentrations in a batch reactor.

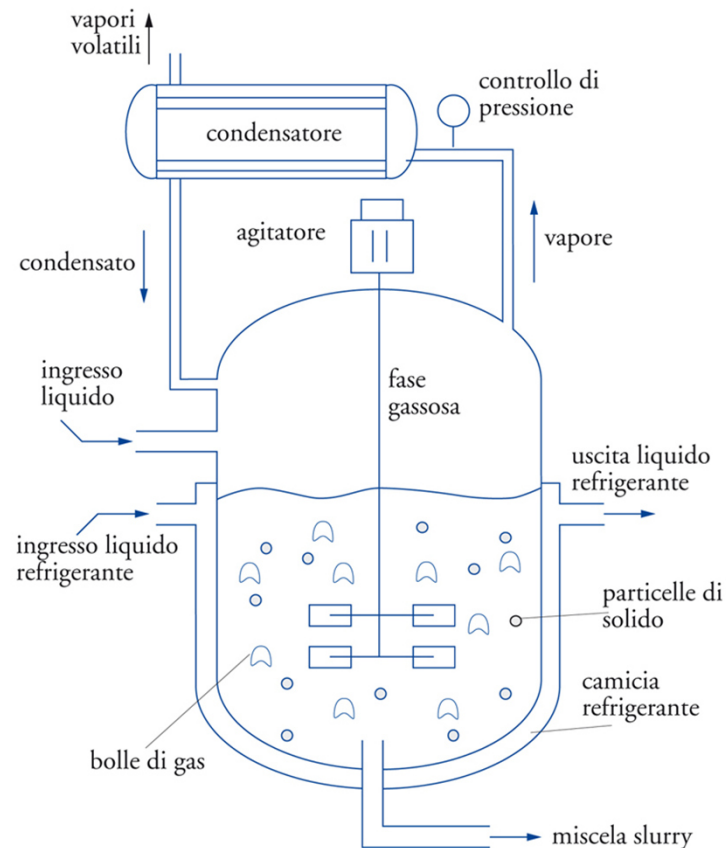


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Subject: Control Systems technology & Control Systems 2 (ING-INF/04)

Batch Reactor



- * A Batch reactor is a discontinuos reactor without **CONTINUOUS FLOW** of the **REAGENTS** in **INPUT/OUTPUT** and it's used in the chemical industry. At the time **T_0** the reagents are introduced in the reactor and at the time **$T_1 > T_0$** the reaction occurs. The behaviour of the chemical batch reactors is as similar well as the **Oil&Gas reactors** and the **Nuclear ones**.

Measurement techniques

- * **Sensor-based measurements** by different types of sensors (Ex: Home sensor network);
- * **Sensorless measurements** by the techniques of redundancy, observer-based (linear/not linear) (Ex: Data Capture Boards);
- * **Virtual measurements (touchless)** by techniques of image processing (Ex: Thermography).

Objective

- * **Sensorless measure system development (H_∞ observer)** based on redundancy for an exothermal batch reactor by System mathematical modelling (HW in the loop);
- * In a real context the observer can be implemented in hardware on an embedded data capture board. It's possible implementing the observer in embedded software/firmware on an electronic board as well.

Applications in the Market

- * Business Processes improvement of the chemical processes in the Automation Lanes;
- * Chemical Plants safety;
- * QA in the chemical Industry and Oil&Gas;
- * Sales in the chemical Industry and Oil&Gas.
- * ERP customization and development in the Chemical industry and Oil&Gas;
- * SCADA development and testing.