

BioProcessTrainer

The *BioProcessTrainer* is a training tool and educational software. With the BioProcessTrainer you may simulate realistic cultivation runs with *Saccharomyces cerevisiae* in a stirred tank reactor. Batch, fed-batch or continuous cultivations may be run under aerobic or anaerobic conditions.

Operation of the Reactor:

- Start up with inoculation
- On-line measurements and sampling for off-line measurements
- PH and foam control
- Temperature and level control
- Simulation in real time and up to 15x-fold accelerated

The screenshot displays the BioProcessTrainer software interface for *S. cerevisiae*. The main window shows a process diagram of a stirred tank reactor with various inputs and outputs. Key parameters are displayed on the right, including O₂, Air, and N₂ flow rates (all at 0.0 L/min), pO₂ (95.8%), pH (7.0), and TR (20.5 °C). The process time is 00:00:47, and the date is 15.04.2013. The interface includes several control panels:

- Controller:** Dissolved oxygen control (Setpoint pO₂: 60.0%), CV: Stirrer speed (high limit: 1300 1/min, low limit: 300 1/min, Gain: 3.0, Ti: 10.0 s, Td: 10.0 s), CV: Air flow rate (high limit: 10.0 L/min, low limit: 3.0 L/min, Gain: 0.7).
- Antifoam:** Setpoint foam high: 0.01 L, Feedrate: 1 mL/min, Relative pumping time: 50.0%, Intervall: 10.0 s.
- pH:** Setpoint pH: 7.0, Gain: 1.0, Ti: 100.0 s, Td: 1.0 s.
- Gas mixing station:** Flow rate O₂, Flow rate air, and Flow rate N₂ (all at 0.0 L/min).
- Medium preparation:** Substrate I Glucose concentration: 5.0 g/L, Substrate II Nitrogen source concentration: 0.0 g/L, Volume: 8.0 L. A button is present to "Press button to fill the reactor with medium".
- History 3:** A graph showing online-trends and measurements for observation and analysis of the cultivation.

Controller setup for important process parameters.

Dialog for gas mixing and medium setup.

Online-trends and measurements for observation and analysis of the cultivation.