

### E6.3.3

#### PROCESS ENGINEERING

##### E6.3.3.2

##### Blue-Bottle Control



Blue-Bottle Control (E6.3.3.2)

Cat. No.	Description	E6.3.3.2
524 013	Sensor-CASSY 2	1
524 220	CASSY Lab 2	1
524 069	Immersion photometer S	1
666 425	Panel frame C50, two-level, for CPS	1
666 438	Woulff's bottle with manometer, CPS	1
667 3095	Screw cap, GL 45, with hole	1
667 3107	Silicone seal GL 45/26, 10 pcs	1
666 482	Aeration pump, controllable, CPS	1
501 44	Connecting leads, 19 A, 25 cm, red/blue, pair	1
667 7977	Electronic Balance 440-3N, 200 g : 0.01 g	1
664 157	Watch glass dish, 125 mm diam.	2
666 966	Spoon-ended spatula, PP, 180 mm	2
666 003	Pipetting ball (Peleus ball)	1
665 996	Graduated pipette, 5 ml	1
665 756	Measuring cylinder, 500 ml, with plastic base	1
604 501	PVC tubing, 7 mm diam., 1 m	1
604 460	Hose clamp, 8...12 mm	1
602 347	Laboratory bottle, 500 ml, GL 45 thread	1
673 2920	Methylene blue solution, 100 ml	1
673 6800	Sodium hydroxide, pellets, 100 g	1
672 1100	D(+)-Glucose, 100 g	1
675 3400	Water, pure, 1 l	1
	additionally required: 1 PC with Windows 7/8/10	

#### Blue-Bottle Control

The blue bottle experiment is a model experiment for an organic redox system. The redox indicator methylene blue is reduced by glucose to its colourless form which is then oxidised by air to form again the coloured version. The air is led into solution by a pump. Additional glucose in solution will then reduce it to its colourless form. The process is reversible. In this experiment an automated version with a two-point control system is used.

#### Topics

- To learn about organic redox reactions and redox indicator methylene blue
- To perform the blue bottle experiment in a new, automated version
- To set up and use a two-point control system
- To perform photometry using an immersion photometer
- To use carbohydrates such as glucose as a reducing agent

Experiments are operated and evaluated with CASSY Lab 2.