CE 400
Gas absorption

Absorption processes are used in air pollution control. One typical application is cleaning exhaust air for the desulphurisation of gases in power stations. The CE 400 trainer allows you to clearly demonstrate the complex theoretical fundamentals of this process in the laboratory.

The device is designed for the absorptive separation of carbon dioxide from an airflow. Water is used as solvent for absorbing the carbon dioxide. This ensures safe operation for the device user.

Principle of operation

The main components of the device are two absorption columns filled with Raschig rings. The previously-cooled air/CO_2 mixture is fed into the absorption columns from below. The solvent (water) trickles downwards in the opposite direction through the absorption columns, whereby the carbon dioxide is dissolved in the water. The water enriched with carbon dioxide in this way can then be regenerated in a desorption column and is then available for absorption again.

Instrumentation

The device is equipped with extensive instrumentation and control technology. All relevant flow rates, temperatures and pressures are continuously measured and displayed. The absorption columns are each equipped with a U-tube manometer to measure the differential pressures. You can check the success of the absorption process using the supplied gas analyser. Therefore you do not need any additional instrumentation in order to obtain quantifiable results.

1	switch cabinet
2	absorption columns
3	U-tube manometer
4	desorption column
5	refrigeration system
6	cooling tank
7	process schematic

Gas analyser for determining the oxygen content and carbon dioxide content.

About the product:

CE 400 is used in many universities worldwide, for example at the University of Hull (England).

A GUNT employee explains the functional principle of CE 400 gas absorption to lecturers at the University of Hull.

Learning objectives

- investigation of the absorption process when separating gas mixtures in a packed column
- determination of pressure losses in the column
- representation of the absorption process in an operating diagram
- investigation of the variables influencing the effectiveness of absorption