Thermosiphon reboiler with rectification column

-Plant under construction-

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Plant design

- Type: Shell-tube-heat exchanger heat transfer area (2.1 m²)
- Heating: Steam, 0.5 … 4 bar
- Pressure: 0.2 … 1 bar, vacuum operation
- Flash pipe: DN 80; length 1 m; 1.4571
- Glas-Column: Height ca. 7 m
- Column sump: DN 150; Height 1.4 m; 1.4571

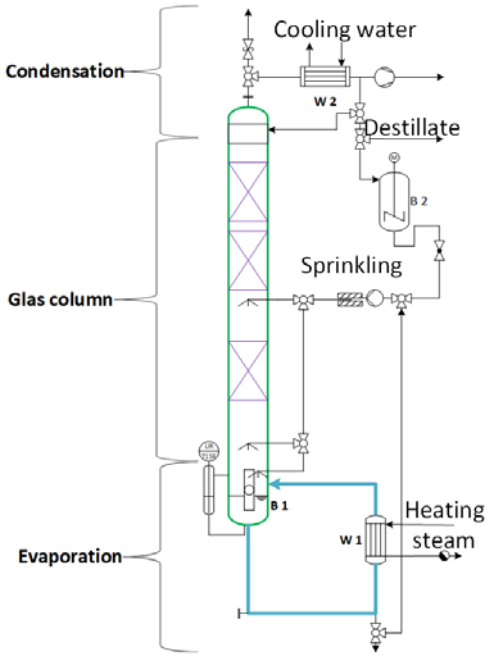
Operating range

- Operating pressure 200 …1000 mbar absolute
- Pressure of heating steam 0.5 … 4 bar absolute
- Gas-Loading f_g = 0.3 … 2 $Pa^{-0,5}$
- Heat duty < 50 kW
- Static liquid head 75 % - 130 %
- Driving temperature difference 15 – 60 K

Drawing

- Thermosyphon reboiler -

Simplified flow chart



Test materials

- Aqueous monoethanolic solutions (MEA)
- 0.1 kg MEA/kg SOL – 0.3 kg MEA/kg SOL
- Optional CO_2 saturation
- Addition of anionic surfactants

Experimental setup

Objective: prevention, inhibition and destruction of foams

- Natural circulation due to pressure difference through boiling
- Mass- and energy balancing product, heating and cooling water side
- Expected foam formation during evaporation in W 1
- Measuring pressure difference over the hight of the column
- Foam flows into the bottom of the glas column (B 1)
- Prevention and inhibition through regulation of process parameters
- Destruction through ultrasound and sprinkling

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