PHYWE excellence in science

Rectification Plant

(incl. Data acquisitation set for set rectification plant)

35918-88
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Installation Manual

Equipment

1	Rack-system f.distillationsapp.	35917-00
1	Destillierkolben, 4 x NS 29, 6000 ml	35873-00
1	Heating mantle for roundbottom flask, 6000 ml	49546-93
1	Power regulator	32288-93
2	Packed column, without silvering, h = 400 mm	35917-01
2	Column intermediate piece, without silvering	35917-02
1	Top head of column with high-efficiency condenser, without silvering	35917-03
1	Plunge pipe with PTFE-valve	35917-04
1	Sampling device with 2 PTFE-valves	35917-05
1	Liebig condensor with vacuum connection, GL 25	35917-06
1	Distillation receiver with 2 PTFE-valves, 50 ml	35917-07
1	Wire mesh rings with cross-piece, steel, 185 g	35917-20
2	Column support	35917-30
1	Teflon sleeve IGJ 29, 10 pcs	43617-00
2	Connecting tube,IGJ29/32-GL18/8	35678-02
1	Connecting tube,IGJ29/32-GL25/12	35678-12
2	Stand tube	02060-00
6	Hose clamp for 5-12 mm diameter	40997-00
2	Hose clamp for 10-17 mm diameter	40998-00
1	Pipettor	36592-00
12	PVC tubing, i.d. 7mm	03985-00
1	Sheath for temp. probe, glass	11759-03
1	Syringe 10ml, Luer, 10 pcs	02590-03
1	Cannula 0.6x60 mm, Luer, 20 pcs	02599-04
4	Clamp for ground joint, plastic, IGJ29	43615-00
1	Closure caps,10, GL18	41220-03
1	Fixing bands,universal,100 pcs.	45535-00
1	Temperature meter digital, 4-2	13617-93
1	Softw. temperature meter 4-2	14405-61
1	Data cable, plug/socket, 9 pole	14602-00
1	Temp. probe, imm., Pt100, stainless steel	11759-01
3	Temp.probe, imm., PT100, -20...+300°C, teflon	11759-04

Fig. 1: 35918-88, rectification plant

General remarks:

We recommend to install the rectification plant in pairs. All the tools you need are included except for scissors or a knife to cut the PVC tubing in pieces. It is very important to assure all the time that no strain occurs in the glass apparatus.

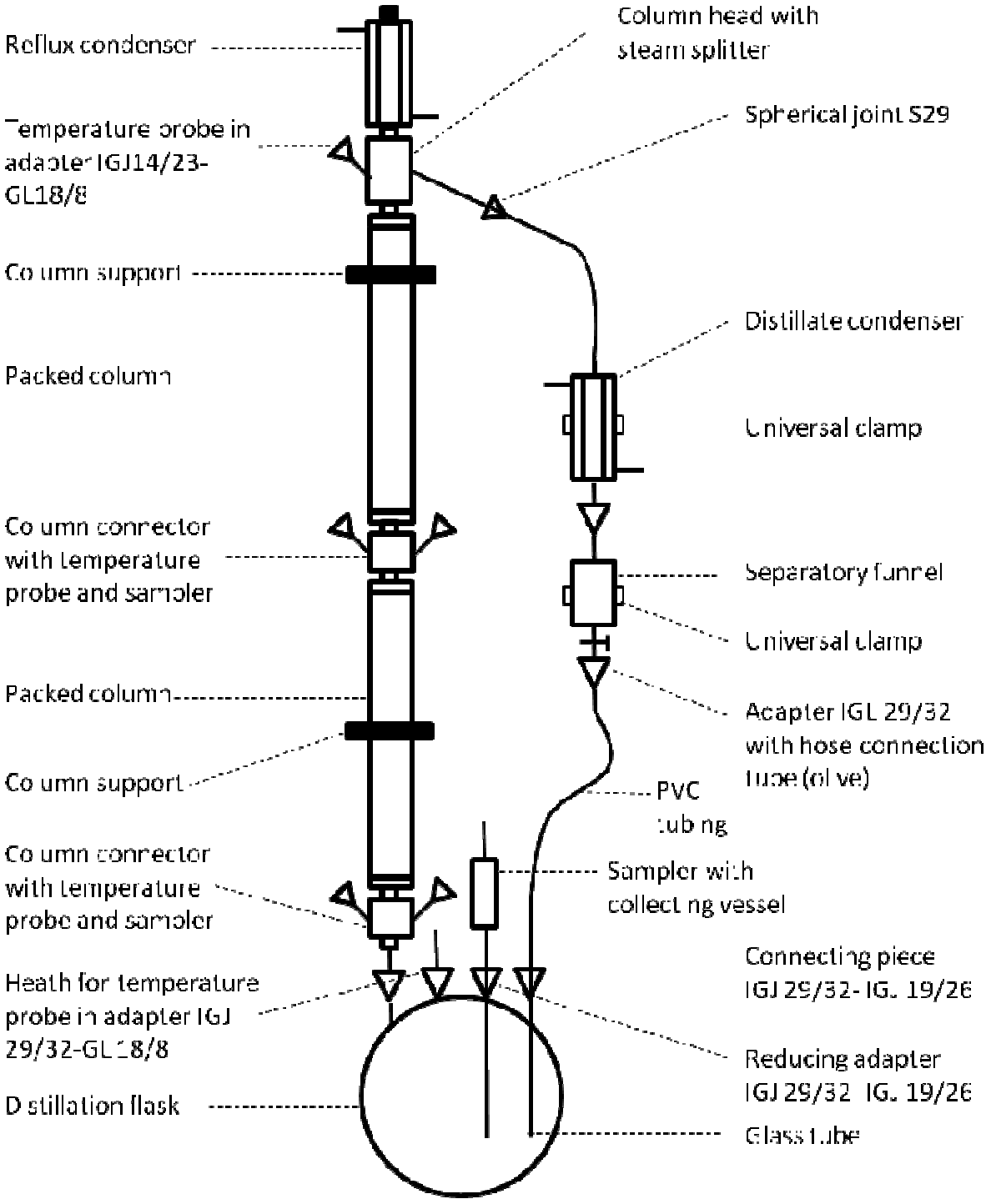

Fig. 2: Distillation apparatus, schematic diagram

1. Arrange the preassembled rack-system for distillation apparatus in the right position.

Fig. 3

2. Place the heating mantle for round bottom flask, 6000 ml, on the left side of the ground plate and connect it to the power regulator

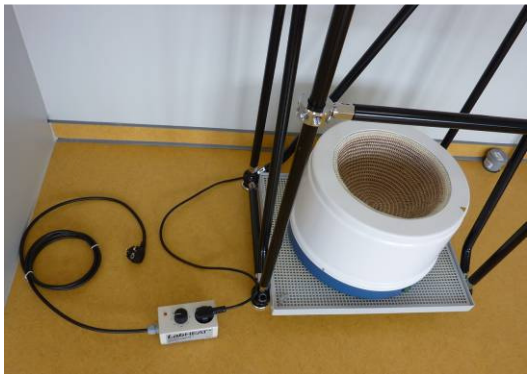

Fig. 4

3. Connect the roundbottom flask with a universal clamp to the stand and adjust its position by moving the horizontal steel pipe.

Fig. 5

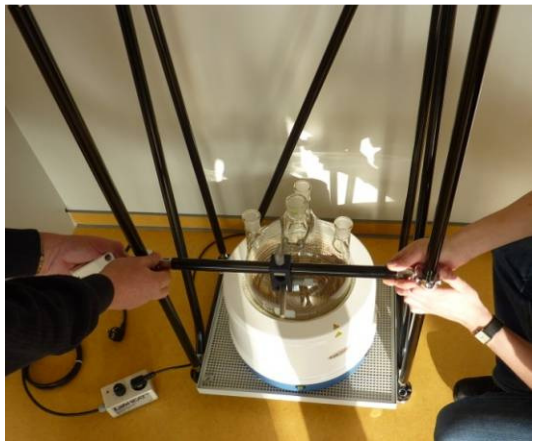

Fig. 6

4. All joints are to be sealed with Teflon sleeves. Make sure that the sleeve covers the whole joint. At first simple put the sleeve on the joint. To cover the last centimeter of the joint, turn the sleeve and simultaneously slide it on the joint. This works best if your fingers are a bit wet. In Fig. 7 the last centimetre is still uncovered.

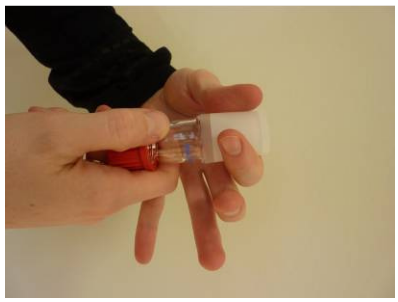

Fig.7

5. Fit a Teflon sleeve to one of the column connectors and position it on the middle joint of the flask. The heath for the temperature probe should be orientated to the back of the column, the sampler to the front.

Fig. 8: Column connector with sampler (left) and heath for temperature probes (right)

Fig. 9

6. Fill one of the columns with wire mesh rings and position it on the column connector.

Fig. 10

Fig. 11

7. Fix the column with the column support to the stand. Make sure, that the apparatus is completely perpendicular. The column support itself is connected via a right angle clamp to the stand.

Fig. 12

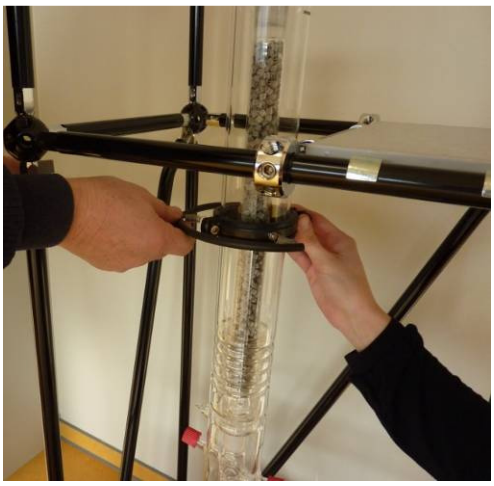

Fig. 13

8. Now you can install the shelve using the support bars enclosed.

Fig. 14

9. Pack the second column with wire mesh rings and mount the second column connector and the second column on the apparatus. Do not forget to attach the teflon sleeves on every joint and to orientate the second connector like the first (see no 4)!

Fig. 15

10. The second column support should be positioned at the upper end of the second column. The column head should be orientated as shown in the figure.

Fig. 16

11. Connect the distillate condenser to the column head and fix it with one of the universal clamps. After that, install the separatory funnel right under the distillate condenser and fix it with one universal clamp, too.

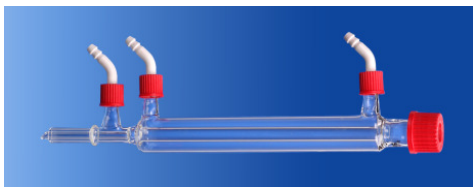

Fig. 17: Liebig condensor with vacuum connection.

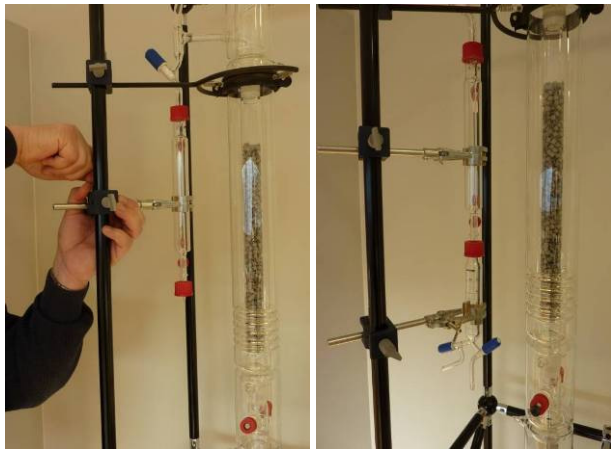

Fig. 18

12. Insert the long glass tube of the plunge pipe into one of the connecting pieces IGJ 29/32-IGJ 19/26 and put it into the left joint of the flask – do not forget the teflon sleeve.

Fig. 19: Plunge pipe

Fig. 20

13. Connect the separatory funnel with the glass tube with a silicon tubing and fix it with hose clamps. Make sure, that you use the hose connection (olive) of the separatory funnel.

Fig. 21

14. Attach the pipettor to the sampling device with collecting vessel and put it via another connecting piece into the flask. Use the clamps for ground joint (red) to fix the connections at the flask.

Fig. 22: Sampling device

Fig. 23

15. Put the heath for temperature probes into the reducing adapter with IGJ 29/32-IGJ 19/26. (This one has the widest opening of the three adapters for the flask) The glass tubes of the sampler with collecting vessel and the heath must not touch the flask.

Fig. 24 Heath for temperature probes

Fig. 25: Reducing adapter with IGJ 29/32-IGJ 19/26

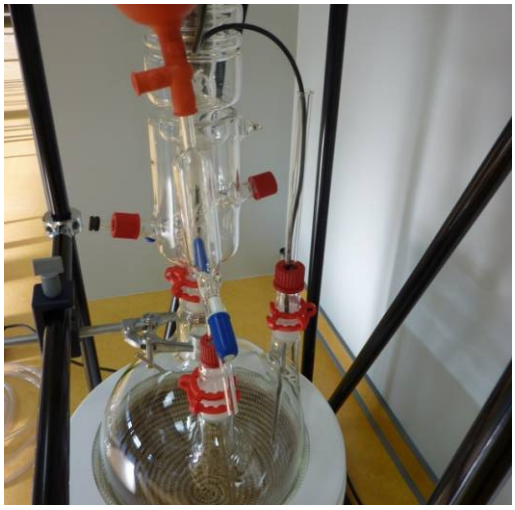

Fig. 26

16. The Pt100 temperature probe made off stainless steel is to be inserted into the heath for temperature probes which is situated directly in the flaks (see fig. 25). The three Pt100 temperature probes made off Teflon are to be used for the other measuring points at the column.

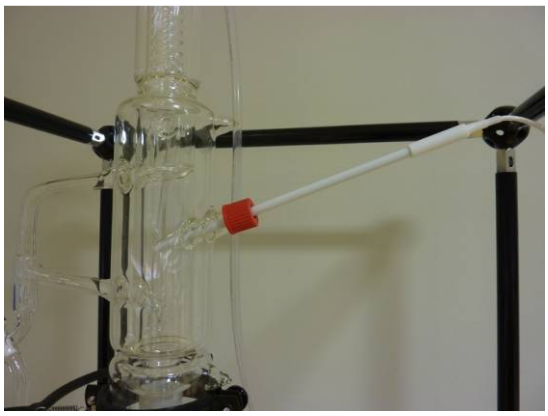

Fig. 27

17. To get samples of the destillate at different positions of the column two sampling stations are situated at the column connectors. They are closed by glass tubes with rubber caps that also serve as a septum.

Fig. 28

18. Connect the reflux condenser and the distillate condenser to cooling water with PVC tubing and fix the tubings with hose clamps (see Fig. 2). They are to be connected in series, starting with the reflux condenser. Fix the PVC tubes with fixing bands.

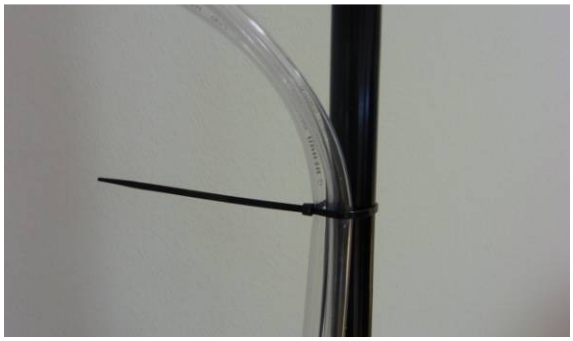

Fig. 29

19. The digital temperature meter is placed on the shelve. The four temperature probes are connected to the temperature meter.

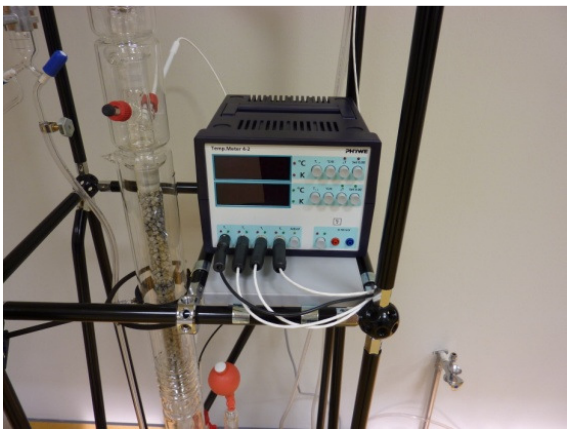

Fig. 30