



LABORATORY WORK No. 23

EXTRACTION

■ PRINCIPLE:

Extraction is a separating and cleaning method which uses the transition of substance from one phase to another one. The component isolated from the mixture of substances in liquid or solid form comes through the phase boundary into another liquid phase – into solvent. The extraction of solid substances is called maceration.

In laboratories there are used apparatus which facilitate the repetitive extraction of substances by means of new doses of solvent, such as the Soxhlet extractor.

Description of the apparatus:

The Soxhlet extractor consists of a boiling flask, a distillation head and a condenser which are mutually connected by ground joints. The sample is put into the extraction shell which is placed in the extraction part of the apparatus. The solvent in the flask is heated to the boiling point, steam rises into the condenser where it condenses and pours down into the extraction shell with the sample. Here the extracted substance dissolves. When the extractor is full, liquid overflows into the distillation flask and the whole cycle repeats. The process stops after a few cycles and the final extract is concentrated by evaporating or distilling off a part of the solvent.

TASK: PREPARE AN EXTRACT OF TEA

■ AIDS

Soxhlet extractor, thermowell, two beakers of 250 ml, distilling equipment-distillation flask, condenser, Erlenmeyer flask

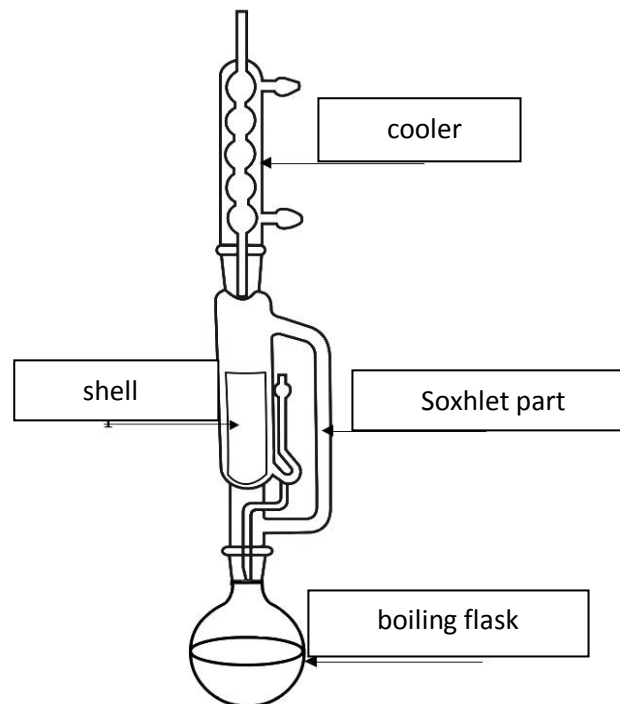
■ CHEMICALS

bulk or portioned tea, distilled water

■ PROCEDURE

1. Make the apparatus according to the drawing.
2. Put one bag of tea into the extraction shell of the Soxhlet apparatus, or weigh appr. 2g of tea, wrap it into the filtration paper and put it into the shell.
3. Pour the solvent / water/ through the top part of the apparatus as long as it overflows into the boiling flask. Add approx. 50 ml of the solvent.
4. Start to heat up the flask to the boiling point of the solvent and let the extraction cycle proceed.
5. Repeat three times. Turn off the heating and wait for cooling of the apparatus.
6. Make the received extract thicker in an ordinary distilling apparatus.

Drawing of the apparatus: Soxhlet extractor



Parts: cooler/condenser, shell, extraction part, boiling flask

■ CONCLUSION

Evaluate the results of the work.

■ Safety:

Don't fasten metal clamps too much with glass parts of the apparatus during putting together. There must be some small clearance in the places of contact due to different thermal expansion of glass and metal during heating up.



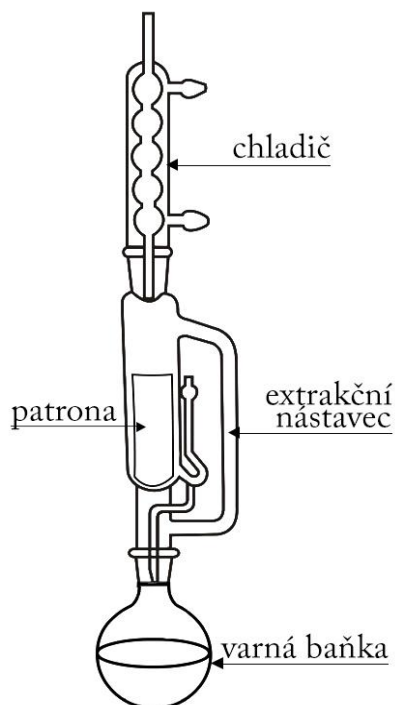
STUDENT'S SHEET No. 23

EXTRACTION

1. Translate these vocabulary:

beaker
boiling point
repetitive
connected with
steam
evaluate
solvent
proceed
transition
pour
drawing
volume
aids
make thicker

2. Mark the apparatus with these words – extractive attachment, boiling flask, extraction shell, condenser





INVESTICE DO ROZVOJE VZDĚLÁVÁNÍ

3. Make sentences

drawing / make / according/ to / apparatus

.....
tea / equipment / inside / put / Soxhlet / one / of / bag

.....
apparatus / makes / in / distilling / the / the / thicker / extract

.....
cycle / bring / to / boiling / proceed / extractive / flask / the / the / point / and / the

.....
solvent / water / at / flask / top / the / pour / is / of / the / apparatus / the / until / in / the / the
/ water / boiling

.....
repeat / times / three /

.....
off / heat / the / turn

.....
apparatus / we / make / in / the / extract / thicker / distilling

.....

4. Rewrite these sentences from the previous exercise into the right order.

.....
.....
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.....
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.....
.....
.....



5. Complete the text with these words:

extraction uses solvent isolated cleaning maceration

_____ is a separating and _____ method which
_____ for the transition from one phase to another one. The _____
part from the compound substance in liquid or solid form transforms into another
liquid phase – into the _____. Extraction of a solid substance is called
_____.