



UNIVERSITY OF RUHUNA – FACULTY OF ALLIED HEALTH SCIENCES

DEPARTMENT OF PHARMACY

THIRD BPHARM PART I EXAMINATION - JUNE 2022

PH 3125 PHARMACOGNOSY II - PRACTICAL

**TIME: THREE HOURS**

**INSTRUCTIONS**

- Answer all questions in the given booklet.
- No paper should be removed from the examination hall.
- Do not use any correction fluid.
- Use illustrations where necessary.

**01.**

Caffeine which belongs to the group alkaloids, is a central nervous system stimulant and it can be isolated from tea leaves.

1.1 Following the steps given below, isolate caffeine from the dried tea leaf powder provided with you and submit the crude caffeine product in a test tube labelled with your **index number**.

**(30 marks)**

1. Place 10 g of  $\text{Na}_2\text{CO}_3$  and 150 mL of water in a 400 mL beaker.
2. Heat the beaker using a flame and a tripod until the  $\text{Na}_2\text{CO}_3$  is dissolved.
3. Add 10 g of tea leaves and two boiling chips to this solution and boil it for 20 minutes.
4. Remove the beaker from the flame and cool it (around  $50^\circ\text{C}$ ).
5. Filter the aqueous layer with a tea strainer.
6. Cool the solution to room temperature.
7. Mix this aqueous solution with 15 mL of  $\text{CH}_2\text{Cl}_2$  in a beaker and swirl gently.
8. Transfer it to a separatory funnel and collect the organic layer.
9. Repeat the steps 7 and 8 for the aqueous layer 3 more times.
10. Combine the organic layers and dry with anhydrous sodium sulphate.
11. Decant the organic layer to a flask and reduce the volume of  $\text{CH}_2\text{Cl}_2$  by evaporation using a water bath.
12. Transfer the content to a **pre-weighed** 50 mL conical flask.
13. Evaporate the solution to dryness on a water bath.
14. Record the weight of the crude product.
15. Submit your crude caffeine product in a labelled test tube.

1.2 Draw the chemical structure of caffeine. (05 marks)

1.3 Write down the steps you would follow to get recrystallized caffeine using 95% ethanol. (15 marks)

1.4 "Na<sub>2</sub>CO<sub>3</sub> solution is added during the extraction of caffeine in order to get rid of some compounds like gallic acid (3,4,5-trihydroxybenzoic acid)". Justify this statement using the structure of gallic acid and chemical reactions involved in this step. (10 marks)

02.

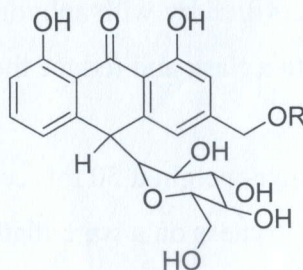
2.1. Briefly explain the acidic extraction method of alkaloids. (15 marks)

2.2. Name **one** method for detection of the following natural products. (15 marks)

- A) Vasicine
- B) Aloinoside
- C) Hesperidin
- D) Vincristine
- E) Linamarin

2.3. A student has reported the following procedure and the observations. Briefly explain underlying principles in chemical aspect of the observation. (10 marks)

"A crude extract containing anthraquinone (Structure of an anthraquinone is given below.) derivative was dissolved in CCl<sub>4</sub>. It was shaken with aqueous ammonia and the aqueous layer became pale pinkish. Another sample of the crude extract was treated with a FeCl<sub>3</sub> solution and HCl. Then it was dissolved in CCl<sub>4</sub> and mixed with aqueous ammonia. Then the ammonia layer turned into a more intense pink color".



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