

PURPOSE

To detect the elements quantitatively, that are most commonly present in organic compounds such as carbon, hydrogen, nitrogen and chlorine.

EQUIPMENT

| | |
|--------------------|------------------|
| test tubes | one-hole stopper |
| ring stand | clamp |
| bent delivery tube | litmus paper |
| burner | copper spiral |

MATERIALS

| | |
|---------------------------------|-------------------------------------|
| CuO | Ca(OH) ₂ solution |
| flour or sugar for C and H test | Hair, urea or fingernail for N test |
| CCl ₄ for Cl test | |

PROCEDURE

PART A: Detection of Carbon and Hydrogen

1. Mix the organic substance with CuO in a test tube.
2. Set up the apparatus as shown in Figure 1.
3. Heat the test tube, which contains the mixture.
4. What do you observe at the Ca(OH)₂ solution and the top of the mixture tube.

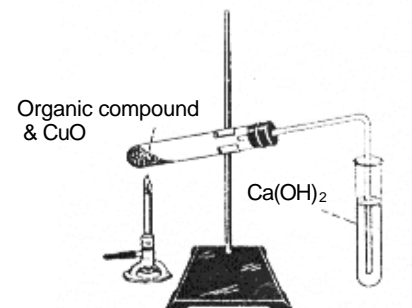


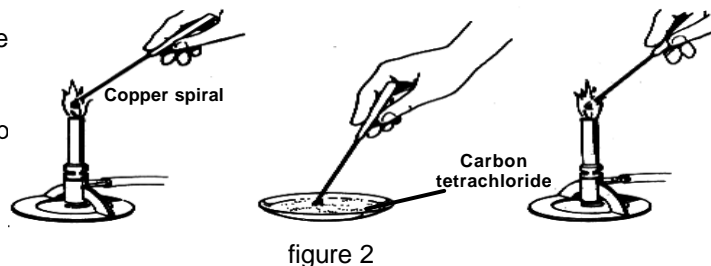
figure 1

PART B: Detection of Nitrogen

1. Put a little amount of the organic substance in a test tube.
2. Add 5-6 drops of 6M NaOH solution and heat the test tube.
3. Add 10-12 drops of 1M NaOH solution and heat the test tube again.
4. Put the wet litmus paper to the top of the test tube. What do you observe?
5. Smell the test tube. A smell of ammonia indicates the presence of nitrogen.

PART C: Detection of Chlorine

6. Take a copper spiral and heat it strongly until it become
7. Put the heated copper spiral to the CCl_4 solution.
8. Put copper spiral to the flame again and observe the ap



QUESTIONS

1. Write all the reactions for the detection of C, H, C and Cl.
2. Why do we use a wet litmus paper during the detection of nitrogen?
3. Why did the color of the flame changes when the copper spiral with Cl is pu the flame?