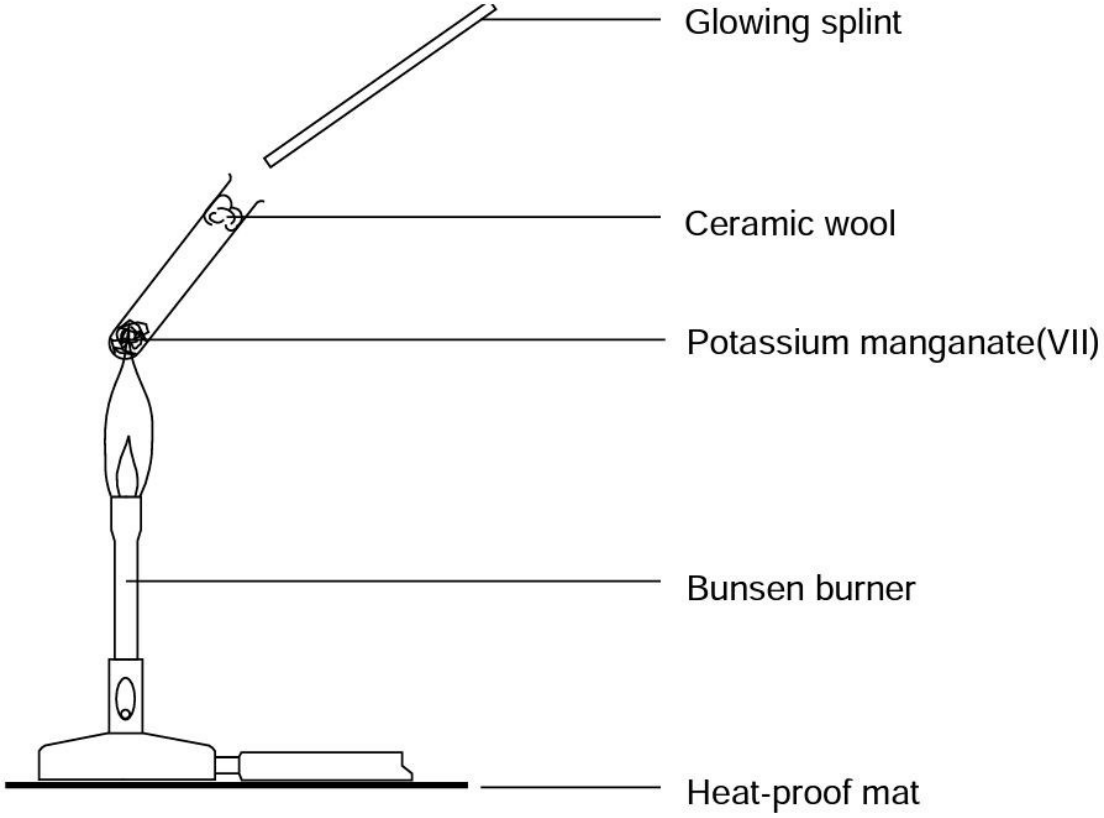
The preparation and properties of oxygen – student sheet

Introduction

Students produce oxygen by heating potassium manganate(VII).



Equipment

Apparatus

- Eye protection
- Test tube holder
- Ceramic wool
- Test tube
- Spatula
- Bunsen burner
- Splints
- Heat-proof mat

Chemicals

- Potassium manganate (VII)

Health, safety and technical notes

- Read our standard health and safety guidance here https://rsc.li/3VUlCyd
- Always wear eye protection.
- When $KMnO_4$ is heated, tiny particles shoot out. (These are trapped by the ceramic wool.)
- Potassium manganate is an oxidiser and harmful, see CLEAPSS Hazcard HC081.

Procedure

1. Place two spatula measures of potassium manganate(VII) in a test tube.
2. Place a small piece of ceramic wool near the top of the test tube. This stops fine dust escaping.
3. Gently heat the test-tube containing the potassium manganate(VII).
4. Light a splint and extinguish it, to make a ‘glowing splint’.
5. Place the glowing splint just above the top of the test tube. Keep heating the test tube. The splint should relight.
6. Scrape out the ceramic wool. Let the test tube cool to room temperature and then wash it out.
7. Notice the colours produced when the test tube is washed out.
8. Record your observations.

Questions

1. What is the chemical formula for potassium manganate(VII)?