The sublimation of air freshener

Learning objectives

1 Describe sublimation and deposition.

2 Understand the difference between sublimation and deposition.

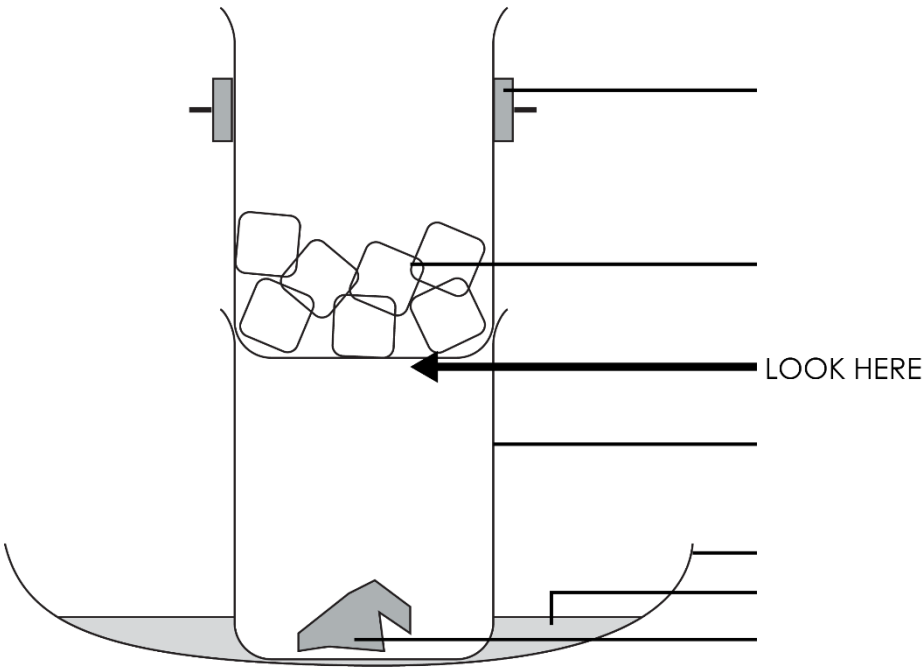
3 Use the particle model to explain sublimation and deposition.

Introduction

Air fresheners are used to make a room smell pleasant and come in different forms including solids, liquids and aerosol sprays. In this demonstration, you will observe the changes of state that occur when a solid air freshener is heated and then cooled.

The demonstration

At the start of the demonstration, your teacher will have set up the equipment in a fume cupboard as shown in the diagram below. Answer questions 1–5 while you are waiting for an observable change.



Questions

1. Use the words below to label the diagram.

ice **hot water** **air freshener** **clamp**

small dish **beaker**

Complete the sentences.

2. The demonstration is carried out in the fume cupboard because some air fresheners produce _____ substances when they are _____ quickly, which are not good to breathe in.

3. _____ was used to slowly heat the air freshener.

4. Ice was added to the top beaker to make a _____ surface for the gaseous air freshener particles to hit.

5. Predict what you will observe during the demonstration.

_____

_____

_____

Observations

Record your observations from the demonstration here.

1. _____

_____

_____

2. _____

_____

_____

Conclusion

Choose the correct word to complete the sentences.

cooled **lost** **gas** **solid** **liquid** **heated** **energy**

evaporation **sublimation** **condensation** **deposition**

When the air freshener was _____ it changed from a solid to a _____ because the particles took in lots of _____. We call this process _____.

When the gas particles hit the _____ surface they turned back to a _____ because they had _____ a lot of energy. We call this process _____.

Changes of state questions

6. Choose the correct word to explain the following changes of state:

evaporation **melting** **sublimation**

condensation **deposition** **freezing**

(a) Solid → liquid (eg ice to water) is known as _____.

(b) Liquid → solid (eg water to ice) is known as _____.

(c) Liquid → gas (eg water to steam) is known as _____.

(d) Gas → liquid (eg steam to water) is known as _____.

(e) Solid → gas (eg dry ice to carbon dioxide gas) is known as _____.

(f) Gas → solid (eg carbon dioxide gas to dry ice) is known as _____.

7. During the air freshener demonstration, two changes of state took place. Draw a circle around the words that best describe those changes of state.

evaporation **melting** **sublimation**

condensation **deposition** **freezing**