

Changes of State

KS3 Chemistry · Follows the national curriculum

Name _____ Class _____ Date _____

1. Worked example

Name each change: (a) butter in a hot pan, (b) a puddle drying up, (c) mist on a cold bathroom mirror.

Step 1 · (a) solid → liquid

Melting.

Step 2 · (b) liquid → gas at the surface, below boiling point

Evaporation.

Step 3 · (c) gas → liquid on a cold surface

Condensation: water vapour in the air cools on the mirror.

Answer: Melting, evaporation, condensation

Check: Say which state it starts in and which it ends in.

2. Now try one with the steps

Is wax solid, liquid or gas at 25 °C? Wax melts at 60 °C and boils at 370 °C.

Step 1 · Compare with the melting point

Step 2 · Decide

Answer:

3. Practice

Show your working. The marks tell you how much is expected.

1. What is the name of the change from liquid to solid? [1]

2. What is the name of the change from gas to liquid? [1]

3. What is the melting point of pure ice, in °C? [1]

4. What is the boiling point of pure water at sea level, in °C? [1]
- _____
- _____
5. What is sublimation? [1]
- _____
- _____
6. Name TWO changes of state that take in energy from the surroundings. [2]
- _____
- _____
7. Give TWO differences between evaporation and boiling. [2]
- _____
- _____
8. Ethanol melts at -114°C and boils at 78°C . What state is ethanol in at 20°C ? [1]
- _____
- _____
9. Oxygen boils at -183°C . What state is it at room temperature (20°C)? [1]
- _____
- _____
10. Describe what happens to the particles when water freezes. [2]
- _____
- _____
11. Does the mass change when 50 g of ice melts in a sealed bag? Give the mass of water formed in g. [1]
- _____
- _____
12. Explain why the temperature stays at 100°C while water is boiling. [2]
- _____
- _____
13. Wet washing dries faster on a warm, windy day. Explain using particles. [3]
- _____
- _____
- _____
14. A student heats stearic acid and records 55°C , 62°C , 69°C , 69°C , 69°C , 75°C . What is its melting point in °C? [1]
- _____
- _____

4. Before you hand it in

"Evaporation and boiling are the same thing."

Evaporation happens only at the surface, at any temperature. Boiling happens throughout the liquid at the boiling point.

"Steam is the white cloud above a kettle."

Steam (water vapour) is an invisible gas. You can see a clear gap just above the spout.

"Melting is a chemical reaction."

Changes of state are physical changes: they are reversible and the particles stay the same.

"Freezing needs cold to be added."

When a liquid freezes, it gives OUT energy to its colder surroundings.