Chemical and Investigating Science Year 7

Topic Test

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Total: 75 marks

Part A: Multiple-Choice (10 marks)

1. Which of the following correctly describes distillation?

**A** a method of separation where particles of liquid, solid or gas stick to the outside surface of a solid.

**B** a process that uses evaporation and condensation to separate solids from liquids or liquids from liquids, enabling the recovery of both.

**C** a process that uses heat to make a liquid solvent change state to a gas, and leave behind the solute it has dissolved.

**D** separation of solids or liquids from a liquid or gas by using a barrier with holes smaller than particles being separated.

2. Fast evaporation results in:

**A** small crystals.

**B** no crystals.

**C** large crystals.

**D** small or no crystals.

3.In an experiment an independent variable is the one:

**A** you change.

**B** you measure.

**C** you keep the same.

**D** you observe.

4. Which separation technique would be useful in determining the colours a black marker is composed of?

**A** filtration.

**B** chromatography.

**C** distillation.

**D** absorption.

5. Which of the following are **all** physical properties:

**A** state, colour, freezing point, reaction with oxygen.

**B** colour, melting point, flammability, state.

**C** density, hardness, colour, state.

**D** reaction rate, freezing point, state, colour.

6. Which of the following are **all** properties of a liquid?

**A** fixed size and volume, cannot be poured, fixed shape, cannot be compressed.

**B** no fixed volume, can be poured, take the shape of the container, can be compressed.

**C** fixed size and volume, cannot be poured, fixed shape, cannot be compressed.

**D** fixed size and volume, can be poured, take the shape of the bottom of container, cannot be compressed.

7. Which of the following explains why gases can be compressed?

**A** particles in a gas are spread far apart.

**B** there are no bonds between gas particles.

**C** particles in a gas move quicker when heated.

**D** particles in a gas are close together.

8. A quantitative observation involves:

**A** just watching.

**B** words.

**C** numbers.

**D** diagrams.

9. Which of the following describes a hypothesis?

**A** what you plan to do.

**B** an educated guess at what might happen.

**C** a list of all the equipment.

**D** a list of what you need to do.

10. Changing state from gas to liquid is called:

**A** boiling.

**B** melting.

**C** condensation.

**D** sublimation.

**Part 2: Short Answer (60 marks)**

1. **Match** the following terms with their correct meaning. Note: not all words will be used.

Absorption, chromatography, crystallisation, chemical property, distillation, evaporation, dependent variable, physical property, controlled variable, tripod, independent variable, compressed, grams, atom, boiling, incompressible, condensation, state or phase, freezing, sublimation, litres, melting, Bunsen burner, metres, gauze mat,

a) Held constant throughout an experiment \_\_\_\_\_\_\_\_\_ *controlled variable*

b) Using heat to make a liquid solvent change state to a gas, and leave behind the solute it had dissolved \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ *evaporation*

c) How substances react with other substances \_\_\_\_\_\_\_\_ *chemical property*

d) Solid, liquid, gas \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ *state or phase*

e) The units of mass \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ *grams*

f) Not able to be compressed \_\_\_\_\_\_\_\_\_\_\_\_ *incompressible*

g) Changing a liquid to a solid \_\_\_\_\_\_\_\_\_\_ *freezing*

h) Three legged stand that goes over a Bunsen \_\_\_\_\_\_\_ *tripod*

i) Change of state from solid to gas \_\_\_\_\_\_\_\_\_\_\_\_\_  *sublimation*

j) Tiny particles that make up matter \_\_\_\_\_\_\_\_\_ *atoms*

(10 marks)

2. **Draw** and **label** a scientific diagram of the equipment used to distil salt water

*See p.141 Pearson Science 7*

*Something very similar to this.*

*2.5 marks for drawing 2.5 marks for labels*

*Must label condenser. Rest is up to you.*

(5 marks)

3. a) You aremaking salt crystals in the laboratory by evaporating water from a salt solution. **Describe** how you could form bigger crystals:

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

*1 mark for saying evaporate slowly, 1 mark if they give a way to do that.*

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(2 marks)

b) **Explain** why the crystals will grow larger if you do this:

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

*They have more time to grow if they evaporate slower*

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(2 marks)

4. a) **List** two physical properties of water \_\_\_\_\_\_\_\_ *colourless, tasteless, liquid, density 1g/cm3*

*can dissolve other substances, boiling point 100oC, melting point 0oC, or any other similar.*

(2 marks)

1. **List** the three states of matter commonly found on Earth \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ *solid, liquid, gas*

(1 mark)

1. **List** three separation techniques for insoluble substances \_\_\_\_ *filtering, sieving, gravity*

*separation, magnetic separation, electrostatic separation, centrifuging, decanting*

(3 marks)

5. A manufacturer wants to remove an expensive solute from an expensive solvent. **Justify** the use of distillation instead of evaporation:

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

*the solvent and solute are expensive so they want them both back. Distillation will retrieve*

*both, whereas evaporation will only retrieve the solute.*

(2 marks)

6. **Explain** the meaning of ‘crystallisation’: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

*1 mark – if they just say forms crystals . 2 marks if they say it is the process of crystal formation when a solution evaporates.*

(2 marks)

7. **Classify** the following as physical or chemical property:

1. Whether it is solid, liquid or gas \_\_\_\_\_\_\_\_\_\_ *physical*
2. Whether is crumbles or scratches \_\_\_\_\_\_\_\_\_ *physical*
3. Whether it burns in oxygen \_\_\_\_\_\_\_\_\_\_\_\_\_ *chemical*
4. Whether it is shiny or dull \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ *physical*

(4 marks)

8. **Identify** the change of state that is occurring (boiling, melting, evaporation, sublimation, condensation, freezing, solidifying):

1. Ice-cream starts to drip \_\_\_\_\_\_\_\_\_\_\_ *melting*
2. Jelly sets \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ *freezing or solidification*
3. Water drops form on the outside of a cold can \_\_\_ *condensation*
4. Dry ice begins to steam \_\_\_\_\_\_\_\_\_\_\_\_\_ *sublimation*
5. Rain on the road disappears \_\_\_\_\_\_\_\_\_\_ *evaporation*

(5 marks)

9. **Define** the following:

i) Line graph \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

*used for continuous data, appears as a line not bars or columns*

ii) Evaporation \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

*using heat to turn liquid into gas*

iii) Chemical property \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

*how a substance reacts with another substance*

iv) Method \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

*tells how to do an experiment*

(4 marks)

10. The following table show how high up a piece of paper different inks travelled when separated by chromatography.

|  |  |
| --- | --- |
| **Ink Colour** | **Distance (mm)** |
| Red | 121 |
| Orange | 132 |
| Yellow | 145 |
| Green | 87 |
| Blue | 45 |
| Indigo | 39 |
| Violet | 28 |

a) Graph the results above as a column graph. (5 marks)

b) **State** which is the heaviest ink? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  *violet*

(1 mark)

1. **State** which is the lightest ink? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ *yellow*

(1 mark)

d) **Describe** the graph \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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(2 marks)

e) **Estimate** where brown might fit on the graph\_\_\_\_\_\_\_\_\_ *anywhere as long as they have a reason!*

(1 mark)

f) **Explain** why you placed brown in that position \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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(2 mark)

11. **Compare** solids, liquids and gases in the table below:

|  |  |  |  |
| --- | --- | --- | --- |
| Property | Solid | Liquid | Gas |
| Shape | *fixed* | *Takes the shape of bottom of container* | *Takes the shape of container* |
| Compressibility | *Cannot compress* | *Cannot compress* | *Can compress* |
| Volume | *fixed* | *fixed* | *Fills container* |
| Particles | *Very close* | *Slightly apart* | *Far apart* |

(12 marks)