

Telling pure substances from mixtures

Grade 7 science (Year 8 · Class 7) · Test answers (mark scheme)

The model answers show the full reasoning and how each mark is earned. Give credit for correct science even if the wording differs. Add the marks to check the total of 20.

Level: Grade 7 science (Year 8 · Class 7) · **Curriculum:** MS-PS1-2

Question 1 Definition (2 marks)

A pure substance contains only one kind of particle. An example is distilled water (or copper, oxygen, salt).

Marking: 1 mark for one kind of particle; 1 mark for a correct example.

Question 2 Reading the diagram (3 marks)

- a. Box M.
- b. Box N, because it has two kinds of particles mixed together.
- c. N melts over a range of temperatures and below the melting point of a pure sample, M melts at one fixed temperature.

Marking: 1 mark for each part.

Question 3 Melting data (3 marks)

- a. $79 - 72 = 7\text{ }^{\circ}\text{C}$.
- b. It is not pure, because it melts over a wide range and begins below the $80\text{ }^{\circ}\text{C}$ of the pure solid.

Marking: 1 mark for $7\text{ }^{\circ}\text{C}$; 1 mark for 'not pure'; 1 mark for a correct reason.

Question 4 Boiling salt water (3 marks)

- a. $100\text{ }^{\circ}\text{C}$.
- b. The reading is higher than $100\text{ }^{\circ}\text{C}$, so the liquid is not pure water: dissolved salt raises the boiling point.

Marking: 1 mark for $100\text{ }^{\circ}\text{C}$; 1 mark for not pure; 1 mark for dissolved salt raising the boiling point.

Question 5 Water tests (3 marks)

- a. Water is present.
- b. Any liquid that contains water, such as juice, would give the same result.
- c. Measure the boiling point and see if it is exactly 100 °C.

Marking: 1 mark for each part.

Question 6 Carat calculation (2 marks)

$8.0 \text{ g} \times 18 \div 24 = \mathbf{6.0 \text{ g}}$ of gold.

Marking: 1 mark for the fraction 18/24; 1 mark for 6.0 g with unit.

Question 7 Identify the solid (2 marks)

The solid is stearic acid, because a sharp melting point shows it is pure and 69 °C matches stearic acid in the table.

Marking: 1 mark for stearic acid; 1 mark for a justification using the sharp melting point or the match.

Question 8 Spot the mistake (2 marks)

The minerals are dissolved in the water, so the bottle contains water mixed with other substances, which is a mixture.

Marking: 1 mark for dissolved minerals; 1 mark for the conclusion that it is a mixture.