Chemistry

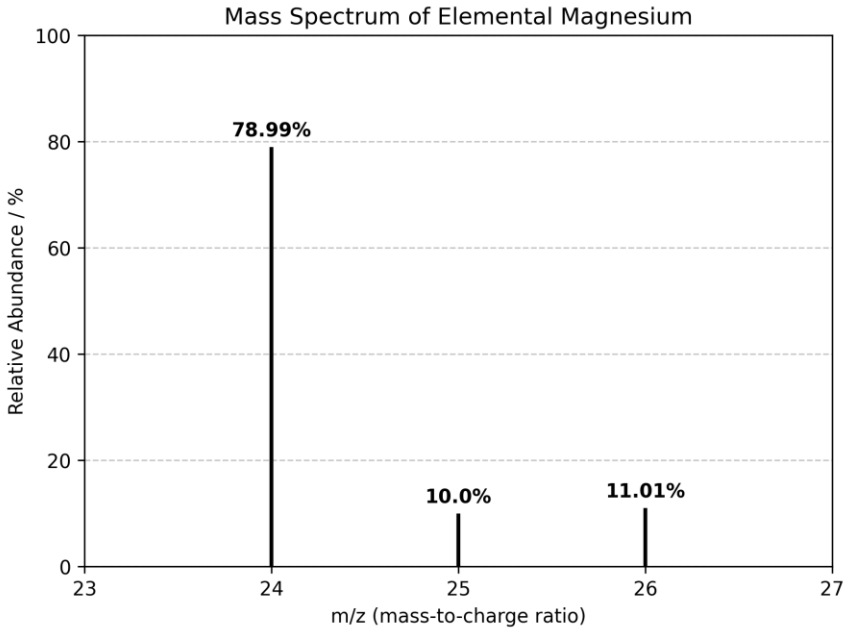
Standard level

Paper 1B

Practice paper

Topic: The Particulate Nature of Matter (SL)

1. Relative atomic masses are determined using mass spectrometry. The spectrum for Magnesium (Mg) is shown below.



(a) Identify the number of isotopes present in this sample of Magnesium. **[1]**

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(b) Calculate the relative atomic mass (A_r) of Magnesium to two decimal places using the data from the spectrum. **[3]**

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(c) State the nuclide notation for the most abundant isotope in the sample. **[1]**

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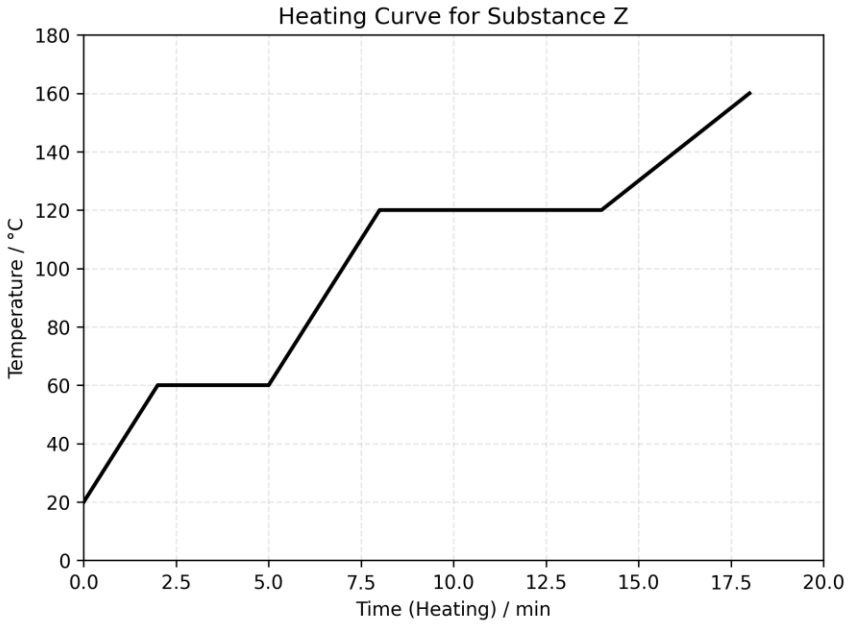
2. A sample of pure 'Substance Z' was heated at a constant rate until it changed from a solid to a gas. The resulting heating curve is shown below.



(a) Explain what is meant by 'phase equilibrium' during the plateaus of the graph. **[2]**

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(b) Identify the state(s) of matter present during the first plateau (from 2 to 5 minutes). **[1]**

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(c) Substance Y has stronger intermolecular forces than Substance Z. Deduce how the length of the boiling plateau (the second plateau) for Substance Y would compare to that of Substance Z, assuming the same mass and heating rate. Justify your answer. **[3]**

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(d) State whether the average kinetic energy of the particles is increasing during the time interval from 5 to 8 minutes. Explain your reasoning. **[2]**

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