**- Mark Scheme /**

**Question Answer Marks AO Element Notes Guidance**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | 1 |  | goes from solid to gas (1)directly / without liquid (beingformed) (1) |  | **2** |
|  | 2 |  | ***liquid:***particles sliding over each other/ particles moving slower than ingas (1) |  | **4** |

particles close together /particles touching (1)

***gas:***

particles moving rapidly / particles moving randomly (1)

particles far apart (1)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | 3 |  | any three of:- evaporation / moleculesescape from surface of ammonia- diffusion- molecules in (constant)movement / molecules collide- (movement of) molecules israndom / in every direction- molecules spread out /molecules mix- (molecules spread) from higherconcentration to lowerconcentration- (smell occurs when) moleculeshit (the sensory cells in) thenose |  | **3** |

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|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | 4 |  | ***solid:***particles (only) vibrating (1)particles close together /particles touching (1) |  | **4** |

***gas:***

particles moving rapidly /particles moving randomly (1)particles far apart (1)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | 5 |  | ***solid:***particles arranged regularly /particles ordered (1) |  | **4** |

particles touching / particlesclose together (1)

***liquid:***

particles arranged irregularly /particles randomly arranged(1)

particles close together /particles touching (1)

6 A: melting (1) **2**

B: condensing /condensation (1)

7(a) **F 1**

7(b) **I** (1) **1**

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**Question Answer Marks AO Element Notes Guidance**

7(c) **F** (1) **3**

**H** (1)

**I** (1)

7(d) **G** (1) **2**

good conductor when solid (1)

7(e) **D** (1) **3**

high melting point (1)

non-conductor of electricitywhen solid or liquid (1)

7(f) **E** (1) **2**

only conducts when

liquid / conducts when liquid butnot when solid (1)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | 8 |  | increasing the temperatureincreases the volume / volumeproportional to temperature |  | **1** |

9(a) arrow under the ceramic boat **1**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | 9(b) |  | direct change from solid to gas(without any liquid stateforming) |  | **1** |

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9(c) any **two** from: **2**

• (hot iron(III) chloride is a) vapour / gas

• flask is cooler

• so iron(III) chloride goes from vapour to solid (where flask cooler)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | 9(d) |  | idea of one substance formingtwo or more substances |  | **1** |
|  | 10 |  | increasing the pressuredecreases thevolume / decreasing the pressureincreases the volume / the higherthe volume, the lower thepressure |  | **1** |

11(a) 80(°C) (1) **1**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | 11(b) |  | horizontal line from end of graphat minute 9 to minute 11 (1) |  | **1** |
|  | 11(c) |  | energy is used to breakbonds / overcome attraction(1) |  | **2** |

between molecules (1)

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**Question Answer Marks AO Element Notes Guidance**

11(d) vibrations (1) **2**

increase (1)

12(a) CnH2n

**1**

12(b) C5H10

**1**

12(c) **E** (1) **2**

it has the longest carbon chain(1)

12(d) **A** (1) **2**

it has the lowest *M* r (1)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | 13 |  | idea of solid turning (directly) togas |  | **1** |

14 **P** = melting (1) **2**

**Q** = condensing/condensation (1)

15(a) **U 1**

15(b) **T 1**

15(c) **S 1**

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**Question Answer Marks AO Element Notes Guidance**

15(d) **R 1**

16 One mark each for any 3 of: **3**

• (limonene) particles go fromliquid to vapour

• diffusion

• random movement of particles/ particles move anywhere /particles move in all directions

• spreading out of particles /intermingling of particles / mixingof particles / particles collide /particles bounce off each other/ particles go all over

• (bulk) movement of particlesfrom higher to lower concentration / movement ofparticles down concentrationgradient

[Total: 60]