| Question | Answer | Extra information | Marks | AO /  Spec ref. |
| --- | --- | --- | --- | --- |
| **01.1** | Phosphate rock is insoluble in water. |  | 1 | AO2  C10.4.2 |
| **01.2** | nitric acid – calcium nitrate and phosphoric acid  sulfuric acid – calcium phosphate and calcium sulfate. |  | 1  1 | AO1  C10.4.2 |
| **01.3** | The factory process produces more fertiliser each day.  The demand for fertilisers is high. |  | 1  1 | AO3  C10.4.2 |
| **02.1** | ⇌  ammonia | Both needed for the mark;  Allow NH3. | 1 | AO2  C10.4.1 |
| **02.2** | Increases;  quickly at first then slows; at any number in range from  160–220 (atmospheres). | Ignore levels off;  allow rate of increase slows for first two marking points;  allow any number in range 60−66 (%). | 1  1  1 | AO2  C10.4.1 |
| **02.3** | (nitrogen and hydrogen) recycled | Allow (nitrogen and hydrogen) reused. | 1 | AO1  C10.4.1 |
| **02.4** | jobs lost | Accept mines closed **or** local economy damaged. | 1 | AO3  C10.4.1 |
| **02.5** | Any **one** from:   * nitrates/fertilisers cost less * more crops/food can be grown * food costs less * nitrates/fertilisers more widely available. | Accept helps fight famine/ hunger around the world. | 1 | AO3  C10.4.1 |
| **03.1** | the distance between the stools |  | 1 | AO1  C10.3.3 |
| **03.2** | 3200 and 3400g |  | 1 | AO3  C10.3.3 |
| **03.3** | = 2500(g) |  | 1 | AO2  C10.3.3 |
| **03.4** | Suitable scale added on *x*-axis and *y*-axis  Half points plotted correctly  All points plotted correctly. | Must use full width of grid;  must use height of grid. | 1  1  1 | AO2  C10.3.3 |
| **04.1** | water  oxygen |  | 1  1 | AO1  C10.3.1 |
| **04.2** | A |  | 1 | AO2  C10.3.1 |
| **04.3** | to absorb water vapour |  | 1 | AO2  C10.3.1 |
| **04.4** | magnesium  zinc | Accept aluminium. | 1  1 | AO1  C10.3.1 |
| **05** | **Level 3 (5–6 marks):** Reasonably detailed comparison of properties and structures of both types of polymer. | | 6 | AO1 × 4  AO2 × 2  C10.3.3 |
| **Level 2 (3–4 marks):** Basic comparison of properties or structures of both types of polymer. | |
| **Level 1 (1–2 marks):** Description of properties or structure of one type of polymer. | |
| **Level 0 (0 marks):** No relevant content. | |
| **Indicative content:**  Glue gun:   * must melt and re-harden * thermosoftening * no crosslinks * weak forces of attraction between molecules/chains * chains can slide.   Kettle:   * must withstand high temperatures * thermosetting * crosslinks between chains * chains cannot slide/held in place.   *This indicative content is not exhaustive, other creditworthy responses should be awarded marks as appropriate.* | |