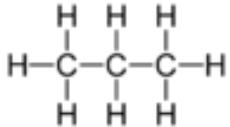
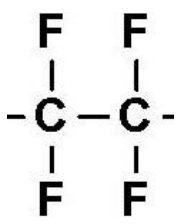


GCSE Mark Scheme – Chemistry 2

| Question Number | | Sub-section | | Mark | Answer | Accept | Neutral answer | Do not accept |
|-----------------|--|-------------|--|------|--|--------|----------------|---------------|
| 1 | | (a) | | 2 | metallic → malleable and ductile / high melting point simple molecular → gas or liquid at room temperature giant covalent → high melting point all 3 for (2) any 1 for (1) | | | |
| | | (b) | | 3 | thermochromic pigment (1) shape memory polymer (1) hydrogel (1) | | | |


| Question Number | | Sub-section | | Mark | Answer | Accept | Neutral answer | Do not accept |
|-----------------|--|-------------|------|------|---------------------------|--------|----------------|---------------|
| 2 | | (a) | | 1 | electron | | e | |
| | | (b) | | 2 | proton (1) neutron (1) | | p n | |
| | | (c) | (i) | 1 | 14 | | | |
| | | | (ii) | 1 | 2,8,4 | | | |

| Question Number | | Sub-section | | Mark | Answer | Accept | Neutral answer | Do not accept |
|-----------------|----|-------------|-------|------|--|--|--------------------|--------------------------|
| FT | HT | | | | | | | |
| 3 | | (a) | (i) | 1 | the higher the temperature the shorter the reaction time | higher temp, faster reaction | | |
| | | | (ii) | 2 | surface area (1) the greater the surface area the shorter the reaction time / faster reaction (1) or particle size (1) the smaller the particle size the shorter the reaction time / faster reaction (1) both marks could be credited for one statement e.g. smaller particles react faster | 'form' of calcium carbonate 'powder takes less time than chips' | | molecules become smaller |
| | | | (iii) | 2 | volume of acid (1) concentration of acid (1) mass/weight of calcium carbonate (1) max (2) | 'amount of' once only | pH type of acid | |
| | | (b) | | 2 | mass decreases (1) gas / carbon dioxide lost from container / released (1) | gets lighter | gas produced | incorrect gas named |

| Question Number | | Sub-section | | Mark | Answer | Accept | Neutral answer | Do not accept |
|-----------------|--|-------------|------|------|--|----------|-----------------|---------------|
| 4 | | (a) | | 3 |  (1) C_6H_{14} (1) methane (1) | | | |
| | | (b) | (i) | 1 | ethene | C_2H_4 | | polyethene |
| | | | (ii) | 1 | monomers | | unsaturated | |
| | | (c) | (i) | 1 | polytetrafluoroethene | PTFE | | |
| | | | (ii) | 1 |  | | ignore brackets | |

| Question Number | | Sub-section | | Mark | Answer | Accept | Neutral answer | Do not accept |
|-----------------|----|-------------|--|------|--|-----------------------------|----------------|--|
| FT | HT | | | | | | | |
| 5 | | (a) | | 3 | all points plotted correctly (2) 4 points plotted correctly (1) smooth curve through points (1) | ½ square tolerance | | |
| | | (b) | | 1 | the higher the temperature the higher the solubility | it increases with more heat | faster | higher solubility, higher temperature |
| | | (c) | | 3 | crystals form (1) any reference to crystals/solid/powder allows access to second mark even though first mark may not have been awarded as solubility is lower at lower temperature (1) both marks may be awarded based on a quantitative response | solid forms | | it solidifies / potassium chlorate forms |

| Question Number | | Sub-section | | Mark | Answer | Accept | Neutral answer | Do not accept |
|-----------------|----|-------------|------|------|---|-----------------------------|----------------|---------------|
| FT | HT | | | | | | | |
| 6 | | (a) | | 2 | 3 molecules of CO ₂ (1) must get first mark to be awarded second 5 molecules of O ₂ (1) | | | |
| | | (b) | (i) | 2 | identification of all bonds made e.g. 4 x O–H (1) 1852 (1) award (2) for correct answer only (cao) | max (1) if subtraction done | | |
| | | | (ii) | 2 | 485 kJ calculated (1) allow error carried forward (ecf) from (i) more energy given out than taken in (1) | | negative value | |

| Question Number | | Sub-section | | | Mark | Answer | Accept | Neutral answer | Do not accept |
|-----------------|----|-------------|-------|--|------|---|---|---|---------------|
| FT | HT | | | | | | | | |
| 7 | 1 | (a) | (i) | | 2 | E (1) two shells occupied / containing electrons (1) | Ne | | |
| | | | (ii) | | 2 | B and E (1) both have full outer shells of electrons (1) | Ar and Ne 8 electrons in outer shell | | |
| | | | (iii) | | 1 |  | 2 | | |
| | | (b) | | | 2 | electronic structure is 2,8,7 therefore 17 electrons / atomic number is 17 (1) number of electrons is equal to number of protons (1) both marks may be credited for one statement e.g. total number of electrons is equal to number of protons / contains 17 electrons therefore nucleus contains 17 protons (2) | | any reference to adding number of electrons in each shell | |

| Question Number | | Sub-section | | | Mark | Answer | Accept | Neutral answer | Do not accept |
|-----------------|----|-------------|--|--|------|--|--|----------------|---------------|
| FT | HT | | | | | | | | |
| 8 | 2 | (a) | | | 2 | pH6 – should be pH 11-12 (or alkaline) (1) burns with an orange flame – should be lilac flame (1) | 8-14 / above 7 lithium with implication that reaction should be more rapid (but less rapid than reaction of sodium) | | 7 or above |
| | | (b) | | | 4 | flame test (1) yellow flame (1) (add) silver nitrate (solution) (1) white precipitate (1) must have correct test for observation mark to be awarded | orange flame | | |

| Question Number | | | | | | | | | |
|-----------------|----|-------------|------|--|------|---|--------|----------------|---------------|
| FT | HT | Sub-section | | | Mark | Answer | Accept | Neutral answer | Do not accept |
| 9 | 3 | (a) | | | 2 | AlCl ₃ (1) formula must be correct to get balancing mark 2,3,2 (1) | | | |
| | | (b) | (i) | | 2 | 102 (2) if incorrect allow (1) for (27 x 2) + (16 x 3) no ecf within part (i) | | | |
| | | | (ii) | | 1 | 47 ecf possible from part (i) | 47.1 | | |

| Question Number | | Mark | Answer |
|-----------------|----|------|---|
| FT | HT | | |
| 10 | 4 | 6 | <p>Indicative content: how it is carried out – spot of each ink on pencil line and dip end of paper in water, leave for water to rise up paper what happens – water dissolves ink and carries the components different distances according to their solubilities, appear as spots/streaks on paper / as chromatogram results – if inks contain the same pigments, the pattern of spots would be identical; different pattern if inks contain different pigments</p> <p>5-6 marks: The candidate constructs an articulate, integrated account correctly linking relevant points, such as those in the indicative content, which shows sequential reasoning. The answer fully addresses the question with no irrelevant inclusions or significant omissions. The candidate uses appropriate scientific terminology and accurate spelling, punctuation and grammar.</p> <p>3-4 marks: The candidate constructs an account correctly linking some relevant points, such as those in the indicative content, showing some reasoning. The answer addresses the question with some omissions. The candidate uses mainly appropriate scientific terminology and some accurate spelling, punctuation and grammar.</p> <p>1-2 marks: The candidate makes some relevant points, such as those in the indicative content, showing limited reasoning. The answer addresses the question with significant omissions. The candidate uses limited scientific terminology and inaccuracies in spelling, punctuation and grammar.</p> <p>0 marks: The candidate does not make any attempt or give a relevant answer worthy of credit.</p> |