# Mark scheme

## Metallic elements and alloys

Chemistry 0620 · Questions from Paper 1, Paper 2 and Paper 3

Total marks

**40**

**MARKS FOR EACH QUESTION**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | 1 | 1 | 1 | 1 | 1 | 9 | 10 | 14 | **40** |

**Question 1** **[1]**

**Answer A**

**Question 2** **[1]**

**Answer D**

**Question 3** **[1]**

**Answer A**

**Question 4** **[1]**

**Answer C**

**Question 5** **[1]**

**Answer C**

**Question 6** **[1]**

**Answer A**

**Question 7** **[1]**

**Answer D**

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## Question 8 [9]

| | | |
|---|---|---|
| **8**(a) | 1 mark each for any three of:<br><br>• conduct electricity / conduct heat<br>• malleable<br>• ductile<br>• shiny / lustrous<br>• sonorous / rings when hit | **3** |
| **8**(b)(i) | mixture of metal with another element | **1** |
| **8**(b)(ii) | (alloy is) hard(er) / (more) resistant to corrosion / strong(er) | **1** |
| **8**(b)(iii) | cutlery / chemical plant / surgical equipment | **1** |
| **8**(c) | copper , zinc , magnesium , potassium (2)<br><br>if 2 marks not scored: 1 mark for one consecutive pair reversed | **2** |
| **8**(d) | 14.4 (g) | **1** |

## Question 9 [10]

| | | |
|---|---|---|
| **9**(a)(i) | the more carbon, the higher the strength **ORA** | **1** |
| **9**(a)(ii) | (no) the melting point range does not increase regularly / the melting point range goes up and down / the melting point range remains fairly constant<br>**OR**<br>(yes) the more carbon, the greater the melting point range / the difference between the higher and lower number is greater with more carbon<br>**OR**<br>(yes) the average melting point range is higher the more carbon (except for **D**) / the general trend is for a higher melting point range with more carbon | **1** |
| **9**(a)(iii) | **D** because it is resistant to corrosion | **1** |
| **9**(b) | **A** | **1** |
| **9**(c)(i) | gives strength / so the wire does not break / so the wire does not sag / for support | **1** |
| **9**(c)(ii) | *use:* any suitable use, e.g. food container / saucepan / aircraft body /<br>*property:* any suitable property related to the use, e.g.(food container) resistant to acidic foods / (saucepan) good conductor of heat / (aircraft body) low density / | **1**<br>**1** |
| **9**(d)(i) | A*l* / aluminium<br>it gains oxygen | **1**<br>**1** |
| **9**(d)(ii) | exothermic because the reactants have more energy than the products / exothermic because the products have less energy than the reactants | **1** |

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**Question 10** **[14]**

**10** **(a)** Any four of: [4]

- in solid, particles are arranged regularly (or are ordered) / in a lattice
- in solid, particles are close together
- in solid, particles are not moving / only vibrate / are in fixed position
- in liquid, particles randomly arranged / disordered / have random motion
- in liquid, particles slide over each other / move slowly
- in liquid, particles are close together

**IGNORE**: particles are closer together

Any one of: [1]

- during melting, particles become less ordered
- during melting, particles start moving / move more / move faster

**IGNORE**: during melting, particles get further apart
**NOTE**: there must be a reference to particles to score marks

**(b)** Any three of: [3]

- lustrous or shiny **ALLOW**: silvery
- conduct heat / conduct electricity / conduct
- malleable or can be shaped: **ALLOW**: can be bent
- ductile / can be drawn into wires
- **ALLOW**: solid at room temperature / solid below 37 °C

**IGNORE**: high boiling point / comments about density / sonorous / comments about hardness

**(c)** $Ga_2Cl_6$ [1]

**(d)** **(i)** lower density / better electrical conductor [1]
**IGNORE**: low density / lighter / lightweight / good electrical conductor
**NOTE**: comparative needed

**(ii)** stronger / cheaper [1]
**NOTE**: comparative needed

**(iii)** lower density; cheaper (1 mark each) [2]
**NOTE**: comparative needed

**(e)** food containers / cooking utensils / aircraft or cars (bodywork) / rail truck (or rail car) (bodywork) / bicycles / (drink) cans / foil / windows / doors / roofing / walking poles / alloy magnets / (some types of) CD's / transistors / (high brightness) LEDs / paints / (solid) rocket fuels / coins / guitar plates (or necks) / mirrors / any other suitable use [1]

**[Total: 14]**

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