# Questions on Structure and Bonding 2

1 Draw a diagram showing the structure of a metal such as sodium. [2]

2 Explain why fullerene, $C_{60}$, has a lower melting point than diamond and graphite. [3]

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3 Re-write the following sentences so that they are correct:

*(a) When a metal melts the electrostatic forces between oppositely-charged ions are broken.* [2]

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*(b) Sodium chloride conducts electricity when it is molten because the delocalized electrons are free to move.* [2]

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4 Explain why graphite conducts electricity but diamond does not. [3]

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5 Explain why metals are malleable. [2]

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6 Explain why alloys are generally harder than the pure metal. [3]

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7 In each case state properties of the metal which make it suitable for the particular use: [7]

| ***Metal*** | ***Use*** | ***Properties*** |
|---|---|---|
| Aluminium | Overhead power cables | |
| Mild steel | Car bodies | |
| Stainless steel | cutlery | |
| High-carbon steel | swords | |
| Copper | Hot water pipes | |
| Aluminium | Airplanes | |
| Copper | Saucepans | |

8 Some cars have mild steel bodies and others have aluminium bodies. Suggest advantages and disadvantages of each. [4]

Mild steel bodies:

Advantages: ……...

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Disadvantages: …….

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Aluminium bodies:

Advantages: ……...

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Disadvantages: …….

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9 Explain why the following statements are ***false***

*Sodium has a higher melting point (98 $^{o}$C) than chlorine (-101.5 $^{o}$C) because metallic bonding is stronger than covalent bonding.* [3]

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*$C_{60}$ fullerene conducts electricity because delocalized electrons are free to move.* [2]

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