



Chem!stry

Name: ()

Class:

Date: / /

Assignment Two on Chemical Bonding

Question 1:

Draw a dot-and-cross diagram to clearly show the arrangement of the electrons, and hence the bonding, in the compound that is formed when sodium reacts with sulfur.

[2]

Question 2:

Draw a dot-and-cross diagram to clearly show the arrangement of the electrons, and hence the bonding, in the compound that is formed when silicon reacts with iodine.

[2]

Question 3:

- a) Predict formula of the compound that is formed when aluminium reacts with sulfur.
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- b) Predict the formula of the compound that is formed when selenium reacts with fluorine.
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- [2]

Question 4:

Study the properties of the chemicals that are given in the table below:

Chemical	Melting Point / °C	Electrical Conductivity (Solid)	Electrical Conductivity (Liquid)	Solubility in Water
W	1084	Conductor	Conductor	Insoluble
X	-182	Insulator	Insulator	Insoluble
Y	772	Insulator	Conductor	Soluble
Z	1650	Insulator	Insulator	Insoluble

- a) Which chemical could be silica (sand)?
- b) Which chemical could be calcium chloride?
- c) Which chemical could be methane?
- d) Which chemical could be copper?
- [4]

Question 5:

Tritium is an *isotope* of hydrogen.

- a) Define the term *isotope*.
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[2]
- b) Would you expect the compound formed between sodium and tritium to be ionic or covalent? Explain your answer.
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[2]
- c) Would you expect the compound formed between tritium and oxygen to be a solid, liquid or gas at room temperature and pressure? Explain your answer.
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[2]

Question 6:

Figure 1 shows an insulated copper wire used to construct an electric circuit.

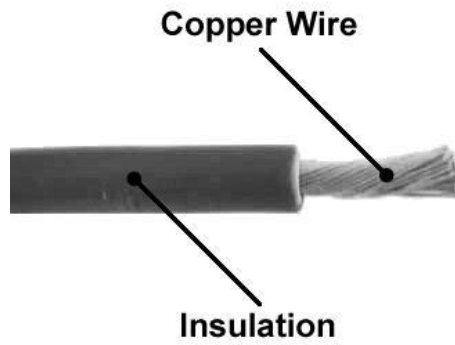


Figure 1. An insulated copper wire.

Briefly explain why, instead of using plastic for their insulation, the wires used to construct fire alarm circuits are insulated using magnesium oxide.

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[3]

Question 7:

Figure 2 shows the structure of brass, which is an alloy of copper and zinc.

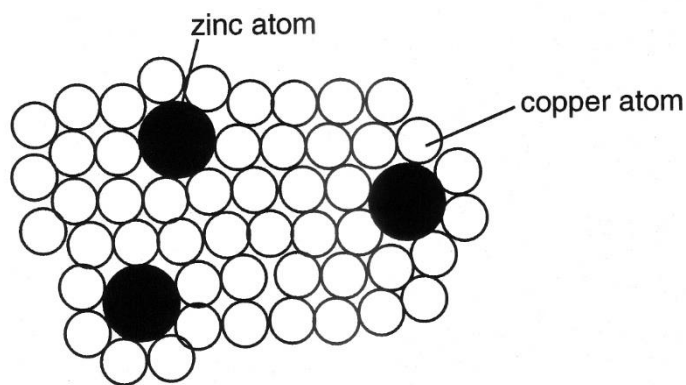


Figure 2. The structure of brass.

With reference to **Figure 2**, briefly explain why brass is *stronger* than pure copper.

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[2]

Question 8:

Figure 3 shows the structure of a single walled carbon nanotube. Single walled carbon nanotubes are formed when a single layer of graphite rolls-up into a tube.

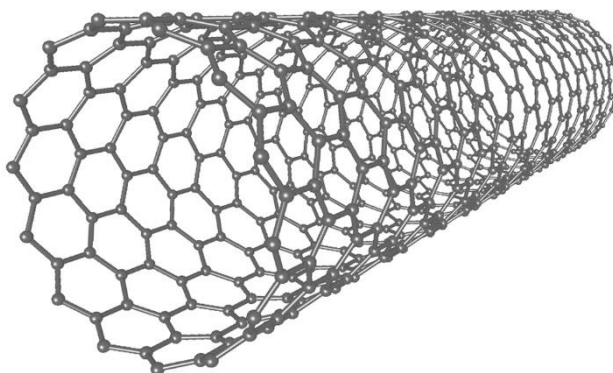


Figure 3. The structure of a single walled carbon nanotube.

- a) Identify one way in which the structure of the single walled carbon nanotube is similar to the structure of graphite.

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[1]

- b) Identify one way in which the structure of the single walled carbon nanotube is different to the structure of graphite.

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[1]

- c) Do you expect the single walled carbon nanotube to be a good conductor of electricity? Explain your answer.

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[2]

- Scan the QR code below for the answers to this assignment.



http://www.chemist.sg/chemical_bonding/assignment/bonding_assignment_two_ans.pdf