Q6a

Mark scheme:

- *Dividing percentages by atomic masses OR calculating Mr of C_2H_3Cl*
- *Correct results of divisions OR working for finding ratio of each element*
- *Obtaining ratio by dividing results by smallest value OR evaluation of correct percentages*

Show, by calculation, that the empirical formula of chloroethene is C_2H_3Cl

(3)

C = 12 H = 1 Cl = 35.5

$\frac{38.4}{12} = 3.2$ $\frac{4.8}{1} = 4.8$ $\frac{56.8}{35.5} = 1.6$ ← smallest

C	H	Cl
$\frac{3.2}{1.6}$	$\frac{4.8}{1.6}$	$\frac{1.6}{1.6}$
= 2	= 3	= 1

C H Cl

2 : 3 : 1

$= C_2H_3Cl$

Show, by calculation, that the empirical formula of chloroethene is C_2H_3Cl

(3)

	C	H	Cl
Mass	38.4%	4.8%	56.8%
Moles	$= \frac{38.4}{12}$ $= 3.2$	$\frac{4.8}{1}$ $= 4.8$	$\frac{56.8}{35.5}$ $= 1.6$
	$\frac{3.2}{1.6} = 2$	$\frac{4.8}{1.6} = 3$	$\frac{1.6}{1.6} = 1$

Empirical formula = C_2H_3Cl.

Show, by calculation, that the empirical formula of chloroethene is C_2H_3Cl

(3)

$A_r(C) = 12$

$A_r(H) = 1$

$A_r(Cl) = 35.5$

38.4 : 4.8 : 56.8

2 : 3 : 1

$(12 \times 2) + (1 \times 3) + 35.5 = 62.5$

$1 - \frac{35.5}{62.5} = 0.568$

$3 - \frac{3}{62.5} = 0.048$

$2 - \frac{24}{62.5} = 0.384$

Q9a

Mark scheme:

M1 *covalent bonds are strong*
M2 *many (covalent) bonds (need to be broken)*
M3 *a large amount of (thermal/heat) energy is needed to break the bonds*

Any mention of intermolecular forces/forces between molecules or ions/ionic bonding /metallic bonding scores 0 out of 3

Has strong carbon to carbon covalent bonds. Strong intermolecular forces of attraction between molecules and bonds which are difficult to break thus resulting in a high melting point.

(3)

Its carbon atoms are tetrahedrally arranged, and each carbon atom is bonded to 4 others, which means there are many strong covalent bonds in diamond. When melting, a lot of energy is required to break these strong covalent bonds between carbon atoms, so it has a high melting point.

That is because diamond ~~has~~ has a complex and strong giant structure, so a very large amount is required to ~~break~~ break down its bonding, so diamond has a high melting point.