

FORM FOUR CLUSTER KCSE MODEL8

CHEMISTRY PAPER 2 QUESTION

1. (a) (i) P : Protons $13\sqrt{1/2}$, mass number = $27\sqrt{1/2}$

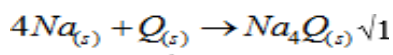
Q: Neutrons $18\sqrt{1/2}$ E.C = $2.8.6\sqrt{1/2}$

(ii) Period $3\sqrt{1}$. Has three occupied energy levels. $\sqrt{1}$

(b) (i) X $\sqrt{1}$ Readily accepts electrons because of its smaller atomic size. $\sqrt{1}$

(ii) Y, Z, and Q . $\sqrt{1}$. Ionic radii are smaller than atomic radii. $\sqrt{1}$

iii)



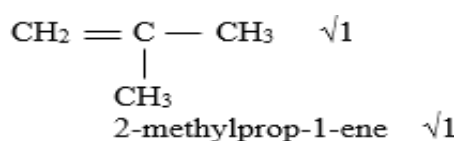
(iv) Ionic bond $\sqrt{1}$

(v) Acidic $\sqrt{1}$

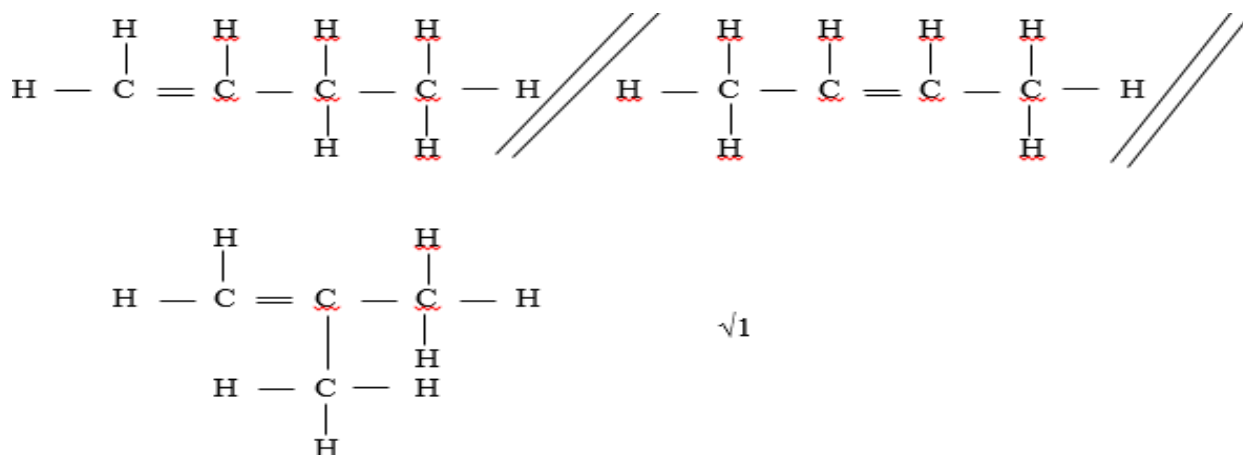
2. (a) (i) $CH_3CH_2CH_2C \equiv CH$

Pent-1-yne

ii)



b)



(c) (i) (I) cpd N-Propane $\sqrt{1}$

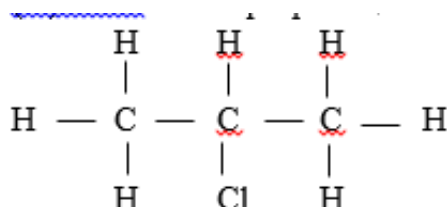
(II) cpd P -Chloropropane//Monochloropropane. $\sqrt{1}$

(ii) Process x –Dehydration.√1

(iii) (I) Addition reaction //hydrogenation (step 2)

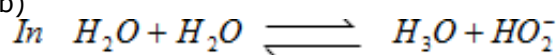
(II) Step 3 –substitution//chlorination reaction.

(iv) 2- Chloropropane.√1



3. (a) The strength of an acid is the degree or extent of dissociation//ionization of an acid in aqueous state; while concentration of an acid refers to the number of moles√ or mass of an acid in a unit/volume.√ (2)

b)



Acid is H_2O_2 √1 donate a proton H^+ to H_2O to form H_3O^+

(i) (I) GRAPHS

(II) Solubility of KNO_3 at $70^\circ = 156/100\text{g} \pm 2\text{g water}$.

CuSO_4 at $70^\circ = 54\text{g} / \pm 2\text{g}/100$ of water.√2

(III) At 4°C solubility of both salts use equal.√1

(IV) Solubility of KNO_3 at $100^\circ \text{C} = 250\text{g} / \text{water}$.

Solubility of KNO_3 at $20^\circ = 30\text{g}/100 \text{ water} = 250 - 30 = 220\text{g}$

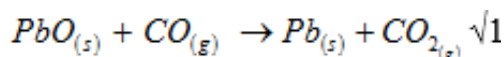
350 g solution gave 220g√1

$$\therefore 262.5\text{g of solution} \rightarrow \frac{262.5}{350} \times 220\text{g} \sqrt{1}$$

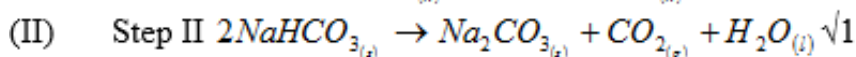
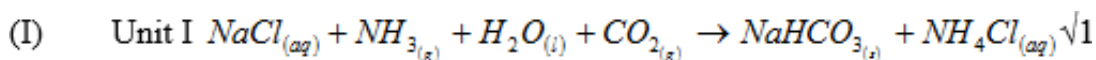
Mass of crystals = 165 g√1

4. (a) (i) Dehydration.√1

(ii) To absorb CO_2 gas.√1



b)



(ii) Filtration.√1

(iii) Calcium agent for gases.√2

(iv) -Manufacture of glass.√1

-Manufacture soap powder/detergents.√1 (Any one correct use)

-Softening hard water.

5. a) i) $\Delta H_1 \text{ and } \Delta H_2$ √1

ii) Atomicisation of oxygen gas√1

iii) Condensation√1

iv)

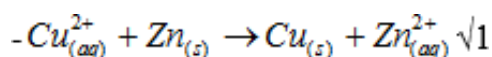
$$\Delta H_f = \Delta H_1 + \Delta H_2 + \Delta H_3 + \Delta H_4$$

v) Exothermic. √1 Overall energy change is below reactants energy level.½1

b) i) -Blue colour of solution fades.√1

-Brown solid deposited at the bottom of the container.√1

ii)



iii)

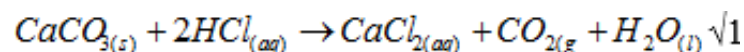
$$\frac{0.2 \times 50}{1000} = 1.0 \times 10^{-2} \text{ moles} \sqrt{1}$$

iv)

$$\begin{aligned} 1 \times 10^{-2} \text{ mole} &\rightarrow 4.2 \times \frac{50}{1000} \times 7^\circ \text{C} \\ 1 \text{ mole} &\rightarrow \left(\frac{4.2 \times 5 \times 10^{-2} \times 7}{10^{-2}} \right) \sqrt{1} \\ &= -147 \text{ kJ/mole} \sqrt{1} \end{aligned}$$

6. a) i) Complete and well labelled diagram including either water or sodium hydrogen carbonate and drying agent.√3

ii)



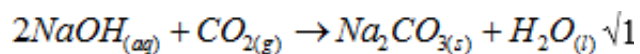
b) -White powder and black specks√1

-White powder is due to the formation of Magnesium Oxide.√1 Black specks due to the formation of carbon.√1

c) Litmus changed to blue√1 because the resultant solution is a base.√1

di) Sodium carbonate.√1 Do not accept formula.

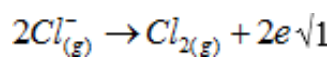
ii)



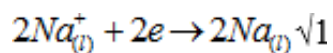
7. a)i) To lower the melting point of sodium chloride.√1

ii) Carbon.√1 It does not react with chlorine.√1

Anode



Cathode



b) It requires a lot of electricity.√1 c)

-In street lights.

-Coolant in nuclear reactors.