

FORM FOUR JOINT EVALUATION 2017

CHEMISTRY PAPER 2

MARKING SCHEME.

1. i) Inert gases///noble gases 1mk
- ii) $DF_3//AlCl_3$; rej F_3D and equation 1mk
- iii) B has a higher melting point than C; 1mk B has strong metallic bonds; $\frac{1}{2}$ mk C has weak van der waals forces $\frac{1}{2}$ mk// B has a giant metallic structure; $\frac{1}{2}$ mk C has a simple molecular structure; $\frac{1}{2}$ mk.
- iv) F more reactive than H; 1mk F gains electrons more readily 1mk
- v) Has more protons// Have a higher nuclear charge. 1mk
- vi) J marked between E and F. 1MK
- vii) Chloride of B is ionic; $\frac{1}{2}$ mk that of D is covalent; $\frac{1}{2}$ mk hence hydrolysed in water to produce acidic solution// to produce hydrochloric acid; 1mk
- viii) $2Na_s + Cl_{2g} \longrightarrow 2NaCl_s$
 moles of sodium: $2.3/23=0.01$; $\frac{1}{2}$ mk
 moles of chlorine gas: $0.01/2=0.005$; $\frac{1}{2}$ mk(correct mole ratio)
 volume of gas used $0.005*24=0.12 \text{ dm}^3$ 1mk
2. a) i. Compounds made of carbon and hydrogen only; 1mk
- ii) High percentage content of carbon; hence some remain unburned. 1mk
- b) i) Process A Fermentatio ; 1mk
- Process B Dehydration; 1mk
- ii) Conc sulphuric (vi) acid ; $\frac{1}{2}$ mk Rej sulphuric acid alone.
- c) i) $CH_3CH_2OH \longrightarrow C_2H_4 + H_2O$; 1MK

ii)



½ mk

iii) Sodium ethoxide; 1mk

hydrogen gas 1mk

d) i) manufacture polythene bags; 1mk

ii) manufacture margarine // hardening oils to fats 1mk. Rej hardening of fats.

e) -Distillation 1mk

- Passing through calcium oxide; 1mk

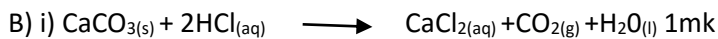
f) B; Forms a soluble magnesium salt hence no scum. 1mk

3. A)-concentration;

-catalyst;

-light intensity;

-temperature.



ii) Scale; 1mk

plots (all correct); 1mk

5 correct; ½ mk

Below 5; 0 mk

Curve; 1mk

iii) tangent drawn at 105; 1mk

gradient worked out; DY/DX; 1mk

answer; 1mk (missing units) ½ mk

range of answers(0.004848,0.005467,0.004444,0.005,0.00563)

C) All the HCL is used up. 1mk

D) Curve starts at 2; ½ mk
 Curve below the first; 1mk
 Levels below the first one; ½ mk

4. A) i) Precipitation// double decomposition; 1mk

ii) blue colour of the solution fades//disappears; 1mk

reddish brown deposit; 1mk

b) iron; 1mk copper; 1mk

c) Fe^{3+} ; 1mk

d) i) SO_2 // Sulphur (iv) oxide; 1mk

ii) 2mks

e) CuCO_3 ; 1mk

f) 2mks

5. a) substance that ionizes in water to produce hydrogen ions// proton donor;1mk

b) NH_3 ;1mk accepts a proton from H_2O ;1mk

c) Crush the tablet and add water; 1mk

Drop universal indicator; 1mk

Compare colour on a pH chart and record the PH.mk

Or

Make a solution of the tablet; 1mk

Insert a pH meter;1mk

Record value of pH ;1mk

d) i) green powder; 1mk

ii) green/blue crystals; 1mk

iii) $2\text{Cu}(\text{NO}_3)_2 \longrightarrow 2\text{CuO}_s + \text{NO}_{2g} + \text{O}_{2g}$; 1mk

- e) Mass of water $56-14=42\text{g}$; $\frac{1}{2}$ mk
 42g of water dissolves 14g of the salt; 1mk
 100g of water dissolves $14 \times 100/42$; $\frac{1}{2}$ mk
 Answer $33.3333\text{g}/100\text{g}$ of water; 1 mk (no or wrong units; $\frac{1}{2}$ mk)

6. a) i) heat given out when a substance burns completely in oxygen; 1mk

ii) Heat change in a chemical reaction is the same regardless of the route followed to convert reactants to products. 1mk

- b)i) temperature change= 16; $\frac{1}{2}$ mk
 mass of methanol= 0.32; $\frac{1}{2}$ mk



- iii) $100 \times 4.2 \times 16/1000 = 6.72\text{kJ}$; 1mk

moles of methanol= $0.32/32 = 0.01$;mk

molar heat= $6.72/0.01 = -672\text{ kJ/mol.}$; 1mk

- iv) heat lost through convection; conduction not accounted for; 2mks

7. a) i) Nitric (V) acid; 1mk
 ii) Nitrogen (II) oxide; 1mk

- b) Platinum/rhodium 1mk

- c) H_2SO_4 ; 1MK
 $\text{H}(\text{PO}_3)_4$; 1MK



- e) NO; 1mk

- f) –Manufacture of explosives

-manufacture of nitrogenous fertilizer

-manufacture of dyes

-refining of gemstones (first two correct 1 mk each)2mks