**SCHOOL BASED EXAMINATION 2019**

**CHEMISTRY 233/2**

**MARKING SCHEME**

**JULY/AUGUST 2019**

1. a) Q ✓ 1 – has the highest number of occupied energy levels. ✓ 1 (2mks)

b) Q – has the largest atomic radius thus valency electron loosely held. (2mks)

c) Alkali metals ✓ 1 (1mk)

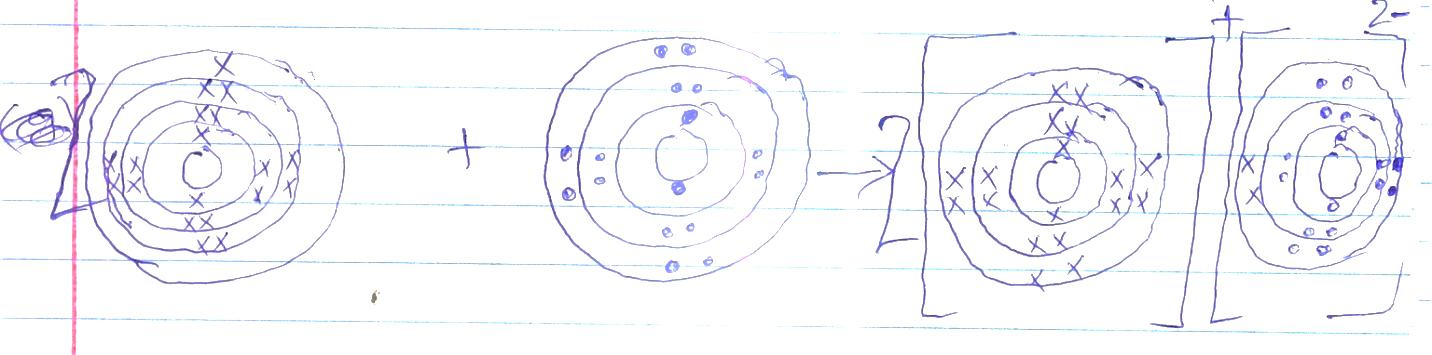
d) S has large atomic radius than U because U✓ 1 has high nuclear charge/More protons

than S ✓ 1 (2mks)

e) V/W✓ 1/2  is stable ✓ 1/2  (1mk)

f) Q+1 (1mk)

g)



2

2

(2mk)

1. a) i) III – Polymerisation✓ 1

IV – Fermentation✓ 1

ii) I – Hydrogen gas✓ 1/2

}

Nickel/Platinum Both conditions to be stated

✓ 1/2

Temperature 150-2500C - Accept any temperature between

150-2500C

II – Concentrated Sulphuric acid ✓ 1/2

Temperature 1800C ✓ 1/2

b) CH3CH2OH + CH3CH2COO H🡪 CH3CH2COO CH2CH3 +H2O ✓ 1 - Ignore state symbols

c) N – Sodium Propanoxide ✓ 1

M – Hydrogen✓ 1

d) – Using KMnO4/H+ ✓ 1 - C3H6 decolourises Accept burning a sample of each

while C3H8 does not ✓ 1

or – using Br2/H2O – C3H6 decolourises

while C3H8 does not

or Burn each C3H8 burns with a blue flame

while C3H6 burns with a yellow flame

e) i) (CH3CH-CH2 )n = 42000✓ 1

42n = 42000

n = 42000/42 ✓ 1 = 100

f) ii) Causes environmental pollution✓ 1

Since it is non-biodegradable

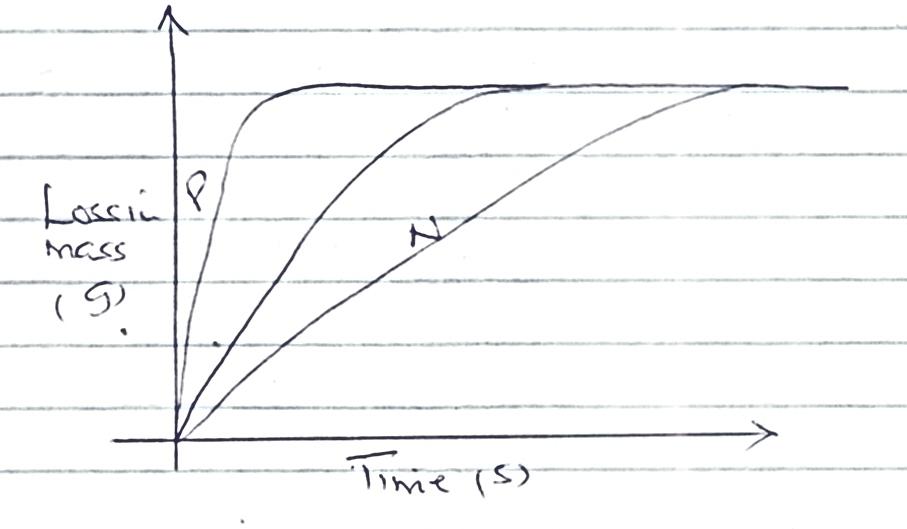
Total 12 marks

**3.** a) i) Zn(s) + H2SO 4(aq) ZnSO 4(aq) + H 2(g) ✓ 1 - Penalise ✓ 1/2  mk for wrong

Missing/incorrect symbol

ii) This is causes by the **escaping hydrogen gas** ✓ 1

b)



The curves should level similarly

c) i) Dynamic equilibrium – A reaction ✓ 1 where the **rate of the *Reject forward reaction is equal***

**forward** reaction is equal to the **rate of the backward reaction *to the backward reaction***

ii) Decrease in pressure causes, equilibrium to **shift to the left** ✓ 1 as

this favours the direction that results to increased ✓ 1 volume // ***Accept alternative words***

increased number of moles of gases. ***Implying suggested response***

II – Decrease in temperature causes the equilibrium to **shift to ,,**

**the right** ✓ 1 as this **favours the direction that results in**

**production of heat.** ✓ 1

d) Aqueous NaOH reacts with the H+ ions **lowering their concentration** ,,

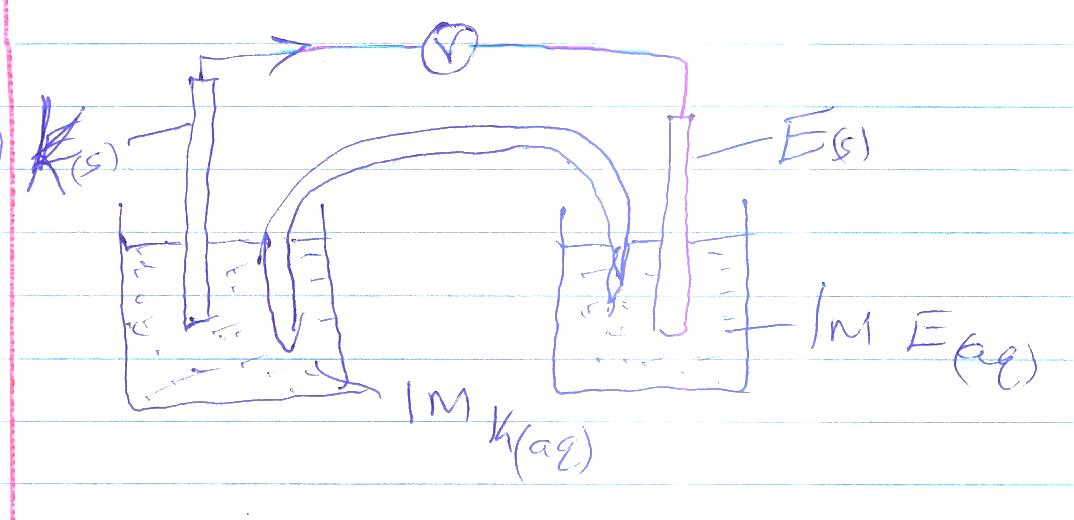
hence yellow colour becomes dorminant as equilibrium shifts to the left.

**4.** a) i) C✓ 1/2  : because it Eθ ✓ 1/2 is 0.00 (1mk)

ii) E ✓ 1/2 – has the highest positive standard electrode potential. ✓ 1/2  (1mk)

b) i) K and E✓ 1 (1mk)

ii)

 (3 mks)

c) E.M.F. = Ered – Eox

= -292 - -0.44 ✓ 1/2 = -2.48✓ 1/2

Overall e.m.f is negative, ✓ 1/2  the rection does not take place. ✓ 1/2 (2mks)

d) i) H – Anode ✓ 1/2

J – Cathode ✓ 1/2 (1mk)

ii) A burning splint is introduced in the mouth of a test tube containing gas F. It extinguishes with a pop sound,

iii) 4OH- (aq) 2H2O + O 2 + 4e ✓ 1

= 4 x 96500 = 386000C✓ 1/2

5 x 201 = 1005C✓ 1/2

386000 – 24000

1005 + 24000 x 10005 ✓ ½= 62.49cm3 ✓ 1/2

386000

**5.** a) i) Zinc blende / Zinc Sulphide✓ 1

II

ii) Q – Sulphur (IV) oxide / SO2 ✓ 1

iii) I R – Calcium oxide and carbon ✓ 1

S – Zinc oxide ✓ 1

P – Coke / Carbon ✓ 1

b) ZnO(s) + C(s) Zn(s) + CO(g) ✓ 1

ZnO(s) + CO(g) Zn(s) + CO2 (g) ✓ 1

c) To provide CaO ✓ 1/2 that remove impurities ✓ 1/2 and CO2 which is reduced by C to

produce CO ✓ 1/2 which is used in the reduction. ✓ 1/2

d) To galvanise iron✓ 1

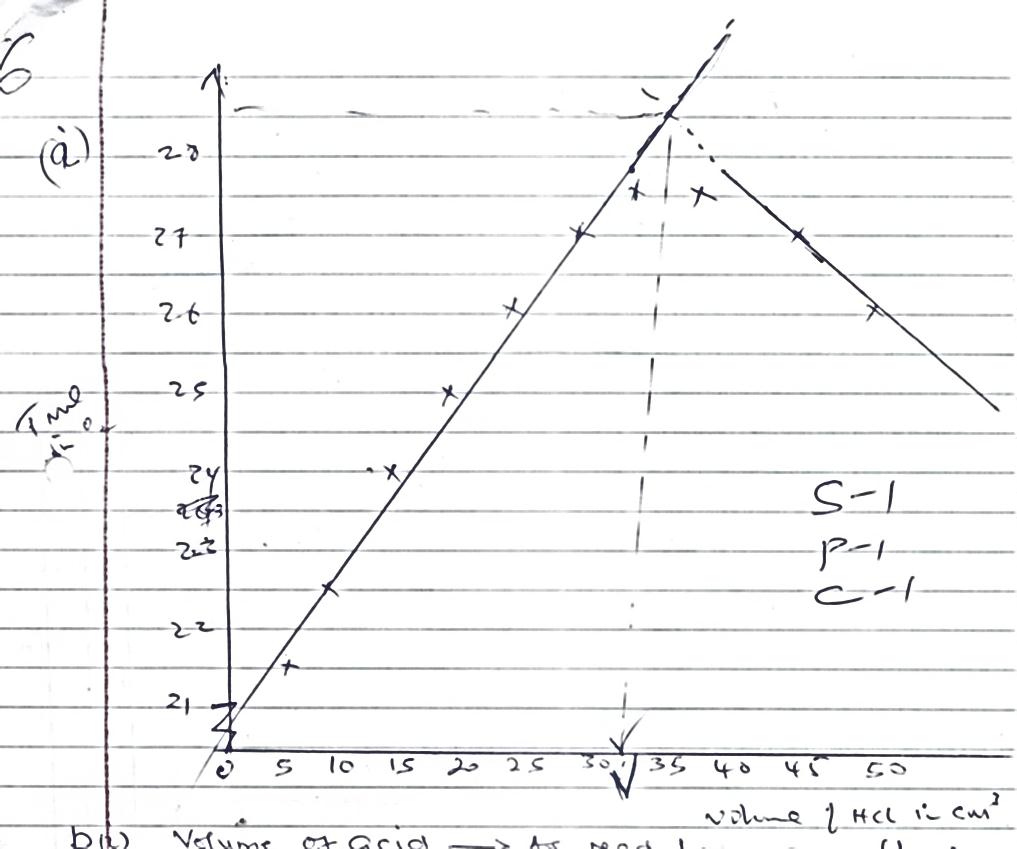
To make brass✓ 1

Making outer casing in dry batteries

e) Contact Process ✓ 1 // Manufacture of Sulphuric (VI) acid

**Total 12 marks**

**6.** a)



**Temp (00C)**

b) i) Volume of acid 🡪 As read from graph. (1mk)

ii) Write balance equation

NaOH + HCl NaCl + H2O ✓ 1

Moles of NaOH = 50 x 1 = 0.005 ✓ 1/2

1000

Moles of HCl = 0.005 moles mole ratio 1 : 1 (2mks)

 Value of the graph x 1000 = Ans✓ 1/2

0.005

✓ 1

iii) Volume of the acid + 50m3 of NaOH x 4.2 x ΔT (value from the graph) = Ans✓ 1

1000

Then continue consequentially. ✓ 1

7. a) i) X – hydrogen / Nitrogen ✓ 1/2  State correct source ✓ 1/2  (2mks)

Y – hydrogen / Nitrogen ✓ 1/2  State correct source ✓ 1/2

b) N 2(g) + 3H 2(g) 2 NH 3(g) ✓ 1 (1mk)

c) F – Ammonium Sulphate

A – Copper ✓ 1/2  each

B – Nitrogen

E – Water (2mks)

d) 2NH 3(aq) + H2SO 4(aq)  (NH4)2SO 4 (aq) ✓ 1

e) i) Redox✓ 1

ii) I – CuO✓ 1 / Copper (II) oxide

II – Nitrogen /NH3✓ 1 /ammonia

f) Used as a fertilizer✓ 1

Total 10 mks