**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