**SET 9**

**CHEMISTRY PAPER 2**

**MARKING SCHEME**

1. (a) Zn (s) + 2HCl (aq)→ ZnCl2 (aq) + H2(g) ( 1mk)

 (b) Concentrated Sulphuric (VI acid or anhydrous Calcium Chloride (1 mk)

 (c) Copper cannot displace hydrogen from its solution. (1mk)

 (d) (i) 2H2(g) + O2(g)→ 2H2O(l) ( 1mk)

 (ii) BEFORE: Pass hydrogen gas through the tube before lighting to drive off air. (1mk)

 END: There should be a continuous flow of hydrogen gas after putting off the flame to avoid an

 explosion. (1mk)

 (e) – Filling balloons

 - Manufacture of margarine

 - Manufacture of ammonia

 - Manufacture of hydrochloric acid

 - Rocket fuel

 - Conversion of coal to synthetic petrol

(Any 2 correct answers – 1mk)

 (f) Zn(s) + H2O (g)→ZnO (s) + H2 (g) ( 1mk)

 (g) S, P, Q, R (2 mks)

 (h) It add to unsaturated oils and hardens them. ( 1mk)

2. (a) B – Ammonia gas (1 mk)

 C – Nitrogen (II) Oxide (NO) ( 1mk)

 E – Water (1 mk)

 F – Unreacted gases ( 1mk)

 (b) The mixture of ammonia and air is passed through heated catalyst (1mk) where ammonia is oxidized

 to nitrogen (II) oxide. (1mk)

 (c) Gases are cooled and nitrogen (II) oxide is further oxidized to nitrogen (IV) oxide. ( 1mk)

 (d) Fractional distillation water, with a lower boiling point than Nitric (V) acid, distills off first leaving

 the concentrated acid. ( 1mk)

 (e) To prevent decomposition. (1 mk)

 (f) Nitric acid is a strong oxidizing agent. ( 1mk)

3. (i) D✓1

(ii) G(s) + E2→ GE2(s)✓1

 (iii) Transition elements ✓1

 (iv) Element L✓1: Because it has only one valence electron which is loosely attracted✓1 to the nucleus

 and can be lost easily.

 (v) H is smaller than✓1 G// H has smaller atomic radius than G. Because H has more protons (nuclear

 change) than G✓1

 (b) (i) T → 22✓1

 Q → 9 ✓1

 (ii) W and X i.e. Period 3.

 (iii) 2R + 2H2O(l)→2ROH(aq) + H2 (g)✓1

 (iv) Since its ion ion has an extra electron which increases the repulsion of electrons. ✓1

 (v) T is more reactive✓1 than U since it has many energy level making its outermost electrons✓1 loosely

 held and are thus lost easily.

4. (a) Blue flame ✓1

 2CO(g) + O2(g)→ 2CO2(g)✓1

 (b)Operate in a well ventilated room✓1

 (c) (i) Yellow✓1

 (ii) Pink ✓1

(d) (i) K+✓1

(ii) C(s) + O2→CO2(g)✓1

 Carbon (II)

Conc. H2SO4✓ ½ Oxide ✓ ½

 Water✓ ½

 Ethanedioic Conc. NaOH✓1

 acid✓½

5. (a) A – Takes in hot compressed air to foam out molten sulphur to the surface. (1 mk)

 B – Takes out molten sulphur ( 1mk)

 C – Takes in superheated water to melt the sulphur. ( 1mk)

 (b) Rhombic; Monoclinic ( 1mk)

 (c) S (s) + O2 (g) → SO2 (g) (1 mk)

 (d) Iron (II) Sulphide. (1mk)

 (e) – Vulcanization of rubber

 - Making chemicals

 - Manufacture of matches and fireworks. Any 2 correct ans (2 mks)

 (f) (i) SO2 (g) + O2 (g) 2SO3(g) ( 1mk)

 (ii) 24dm3 of SO2 = 1 mole

 6.0dm3= 1 mol x 2 dm3

 24dm3

 = 0.25 moles ( 1mk)

 From the equation, moles of O2 used = $\frac{0.25}{2}$

 = 0.125 mole (1mk)

 (iii) 1 mole of O2 = 24dm3

 0.125 moles = 24dm3 x 0.125mol ( 1mk)

 1 mol

 = 3.0dm3 (1 mk)

 H

 |

6. (a) H – C ≡C – C – H (1 mk)

 |

 H
 (b) 2 – methyl propane ( 1mk)

 (c) (i) High temperature ( 1mk)

 (ii) Ethane//C2H6 (1 mk)

 (iii) Its used as fuel ( 1mk)

 (iv) Its non-biodegradable thus it pollutes the environment. ( 1mk)

 (v) Polythene ( 1mk)

 (vi) Hydrolysis ( 1mk)

 (vii) C2H4Cl2 ( 1mk)

 (viii) When ethane is passed through acidified potassium manganate (VII) solution it is not ✓½

 decomposed but if ethyne is passed through the solution it changes from purple to colourless.✓ ½

 When ethyne is passed through brown bromine ✓½ water the bromine water is decomposed while

 ethane doesn’t decolourise bromine water. ½

7 (a)

 Gas jar

 Dry chlorine✓1+

 ✓1

 Conc. H2SO4

 (b) Heating ✓1

 (c) 2KMnO4 (s) + 16HCl(aq)→2KCl(aq) + 2MnCl2(aq) + 5Cl2(aq) + 8H20(l)✓1

 (d) Cl2(g) + 2Br-(aq) →2Cl-(aq) + Br2(l)✓1

 (e) (i) Iron (II) Chloride ✓1

 (ii) Iron (III) Chloride✓1

 (f) Add magnesium powder to each of the solution.

 Solution P no effervescence/hissing sound ✓1

 Solution Q effervescence/hissing sound of colourless.✓1gas.

 (g) 2Fe(s) + 3Cl2(g) →2FeCl3 (s)✓1

 Moles of Fe →$\frac{168}{56}$ = 0.03 mol ✓½

 Moles of Cl2 = $\frac{3}{2}$ x 0.03 = 0.045 moles ✓ ½

 1 mole of Cl2 = 24 dm3

 0.045 moles of Cl2 = x

 x = $\frac{24 x 0.045}{2}$

 = 1.080 dm3 or 1080cm3✓