**CHEM PP1 MARKING SCHEME 2019 TERM 2**

1.(a) This is the energy required to remove the 1st outermost electron from an atom in gaseous state to form an ion √ 1

(b) C A B D √ 1

Increasing reactivity

Higher ionization energy implies high nuclear charge which hinders removal of electron.

2 i)Add excess methylbenzene to the mixture in a beaker (1 mk) and stir (½ mk). Filter (1 mk) to obtain sulpur as a residue (½ mk).

ii)Heterogeneous (1 mk). Its components can be recognized by the naked eye or through magnifying glass (1mk)

3. (a) Pt or copper

(b) No formed is oxidized by O2 to NO2 which is brown

(c) The reaction is exothermic

4.a)Energy change that occurs when one mole of gaseous ions become hydrated//form weak   
bonds with water molecules (1mk)

b)∆Hsoln= Lattice energy + Hydration energy (1mk)

=+2237+(-1891)+2(-384) (1 mk)

= -422 kJ mol-1 (1 mk)

5. 2KOH(aq) + H2SO4(aq) → K2SO4(aq) + 2H2O(l)

36cm3 0.5M 25cm3

Moles of H2SO4 = 0.5 x 25 = 0.0125moles

1000

Moles of KOH = 2 x 0.0125 = 0.025

Molarity of KOH = 0.025 x 1000 = 0.6944

36

≈ 0.7

Concentration in g/dm3 = 38.9g

6.a)

H H H H H H H

C ═ C─ C─ C H H C ─ C ═ C ─ C H

H H H H H H

(1mk) (1mk)

b) Presence of ultraviolet radiation//sunlight (1mk)

c). Substitution

7. (a) Test tube 1 – there is effervescence / bubbles/dissolved.

Test tube 2 – No effervescence / no reaction/ dissolved

(b) Ethanoic acid ionizes in water to release H+ ions which react with CO32- to form CO2

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 8. | (a) Water which contains Ca2+/Mg2+ions√ (1mk)  (b) – Addition of a few drops of hydrochloric acid √ (½mk)  - Gas bubbles/effervescence √ (½mk)  (c) – Brewing industries √ (1mk)  √ (1mk)  - Tie dye, textile industries  - processing of mineral water | | 1  ½  ½  1 | | Accept any 2 correct answers | |
| 9 | | (a)  - Gas C is denser than air √ (1mk)  (b) – Nitrogen (IV) oxide  - Dinitrogen tetraoxide  Air  Gas C in  - Sulphur (IV) oxide  Gas C  - Sulphur (VI) oxide  √ (½mk)  √ (½mk)  - Carbon (IV) oxide  - Chlorine gas  - Hydrogen chloride | | 2  1 | | Accept any two correct answers | |
|  | |  | | 3 | |  | |
| 10 | | (i) O2(g) + 2Mg(s) 2MgO(s) √ (1mk)  (ii) CO2(g) C(s) + O2(g) √ (1mk) | | 1  1 | |  | |

11.a,

*-Q and U,they are isotopes*

b, 7-3= 4✓ 1

12. Condensation polymerization ✓ 1; Reject condensational

|  |  |  |  |
| --- | --- | --- | --- |
| 13 | (a) P1V1 = P2V2; P1 = 750 V1 = 250, T1 = 27 + 273 = 300k  T1 T2  P2 = 750, T2 = 41 + 273 = 311k  V2 = P1V1T2 = 750 x 250 x 311 √ (1mk) = 311x 5  T1 x P2 300 x 750 6  = 259.167cm3√ (1mk)  (b) The volume of a given mas of a gas at constant temeprature is inversely proportional to its pressure√ (1mk) | 1  1  1 |  |

14.a)H2NCH2COOH + H2NCHCH3COOH ﴾ HNCH2CONHCHCH3CO﴿ + 2H2O

b)Condensation polymerization ✓ 1; Reject condensational

|  |  |  |  |
| --- | --- | --- | --- |
| 15 | 1. H2S(g) + 2FeCl3(aq) 3FeCl2(aq) + S(s) + 2H+(aq) 2. -Pass excess gas, H2S through ecess concentrated sulphuric acid √ (½mk) to absorb H2S gas.   o*r*  3H2S(s) + H2SO4(l) 4S(s) + 4H2O(l)   * Hydrogen sulphide gas is poisonous √ (½mk)   (c) - Pass H2S through Lead (II) nitrate solution √ (½mk)  - A black shinny solid precipitate is formed √ (½mk) | 1  ½  ½  1 |  |

- 16.iThe method of collection is wrong (✓ ½ mark)

- The gas is less dense than air (✓½mark) hence can’t be collected by downward delivery.

Ii, Concentrated sulphuric (VI) acid (✓ 1mark)

iii- It’s colourless ✓½mark

Odourless ✓½ mark

- Less dense than air.

*Any two for (½ mark) each*

17. H

3 (H – H) + 2 ( C – C ) H – C – C – H 6 ( C – H )

H H

6 ( C – H) - { 3( H – H ) + 2 (C – C }

= (6 x 414 √ ½ ) – { (3 x 435 √ ½ ) + (2 x 343 √ ½ ) }

= -957 kJ √ ½

Attempt to subtract √ ½

18. (a) Ammonia dissolves √ ½ in water to form ammonia solution which is basic √ ½

(b) Increase surface area to avoid sucking back of the gas. √1

|  |  |  |  |
| --- | --- | --- | --- |
| 19. | * Mix With Cold Water, Sodium Carbonate Dissolves√ (½mk) * Filter off Lead (II) Chloride And Calcium sulphate as residue √ (½mk) * Evaporate to obtain sodium chloride * Mix the residue with hot water to dissolve Lead (II) chloride√ (½mk) * Filter off Calcium sulphate as a residue dry over dessicator * Cool the filtrate to precipitate Lead (II) chloride √ (½mk) * Filter off residue as Lead (II chloride and dry √ (½mk) | ½  ½  ½  ½  ½  ½ |  |

20)a) manganese (iv )oxide

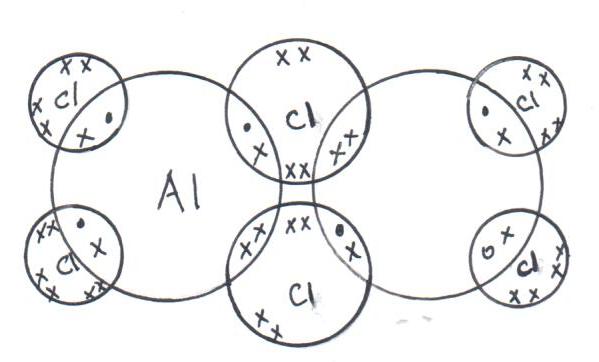
b) to prevent collection of air previously in the apparatus.

22. (i) A – soapy detergent B – soapless detergent

(ii) - Non-biodegradable

- Nuisance as form formed on water bodies is not present.

They are unreactive. *1mk*

*23a)*

•

•

•

•

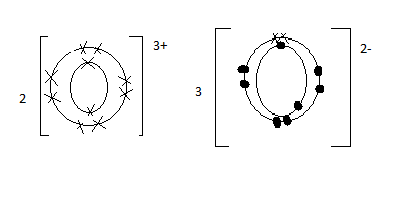
•

•

•

•

b)



24.a) An apparent change an element has in an ion or a compound.

b)i) MnO2 Mn= +4

ii) CrO-4 Cr= +7

25. a)Chlorine water changes colour from yellow to colourless *1 mk*

-Chlorine water decomposes to form hydrochloric acid and oxygen *1 mk*

b) 2HOCl(aq) 2HCl(aq) + O2(g)  *1 mk*

c)-Bleaching agent-Treatment of water *1 mk*