**SUNRISE ONE TERM 1 EXAMINATION -2023**

***Kenya certificate of Secondary Education***

***FORM 4***

**MARKING SCHEME**

1. Procedure 1(a) – Table 1

(a) Complete table ½ mark

-Final temperature must be lower than the initial temperature, otherwise penalize fully

-For initial temperature values>400 or < 100 are treated as unrealistic values.

(b) Accuracy

Compare school value (initially value) with students value, and if within +20C award

( ½ mk) otherwise zero.

(a) ∆T =Final temperature – initial temperature.✓1

(b) (i) ∆H = MC∆T

=40 x 4.2 x ∆T✓1

**Conditions**

-Accept an error of + 2 units in the 3rd digit if answer is in joules or 3rd d.f if in kilojoules, other wise penalize( ½ mk)

-Award 1 mark for correct substitution and ignore the formula.

-Penalize ( 1/2mark) for wrong units shown.

(ii) 2g ans in c(i) above

126g ?

= ✓1

=C.A J/mol.✓1

**Conditions**

-Wrong units given or omitted in final answer, penalize ( ½ mark)

-Accept arithmetic error + 2 units

-Correct sign (+ve) must be shown for ∆H,

**Procedures II(b)- Table**

As table 1 but the final temperature must be higher than the initial temperature

**Calculation**

(a) ∆H =Final temperature - Initial temperature✓1

(b) (i) ∆H =80 x 4.2 x ∆T

=C.A.J✓1

**Conditions**

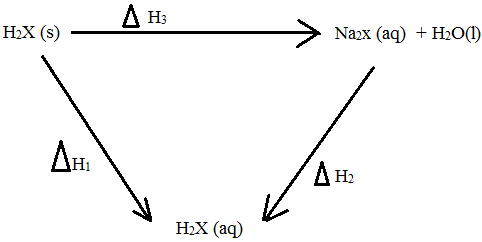
Accept an arror of + 2 in the 4th digit

(ii) Moles reacting ==0.02 moles✓1

∆H2 ==C.A.J✓1

(c) ∆H3 =∆H1 - ∆H2✓1

=C.A.J✓1



**Conditions**

-Negative value must be shown on correct answer, otherwise penalize ( ½ mk)

-Penalize ( ½ mark) for wrong answer .

-For correct substitution without formular.

You will credit ( 1 ½ mk as step II

**NB** Capital J and small k MUST be used

**Procedure II Table III**

Marks must awarded as follows

A (i) Complete table – award ½ mark.

(ii) Incomplete table with two titrations done – award ½ mark

(iii) With one titration- award 0 mark

**Penalties**

-Wrong arithmetic

-Inverted table

-Burette reading beyond 50.0cm3

**NB** Penalize each maximum of ½ mark.

B Decimal place award 1 mark

-Only 1 d.p used consistently, otherwise penalize fully i.e award 0mark

C Accuracy award 1 mark

-Compare the candidate’s titre values with the school value. It must be within + 0.1 school value.

D Principle of averaging –(1mk)

(i) 3 Consistent titres values done, average award a mark.

(ii) 3 titre values are attained but only 2 are possible and are averaged- award (1mk) but if 3 titres are possible but only 2 are averaged- award 0 mark.

E Final answer – 1mark.

Compare the candidate’s correct average titre value with the school value.

(b) **Calculations**

=🗸 ½ mk

=C.A ½ mk)

**Penalties**

-wrong transfer of average titre penalize ½ mark

-An arithmetic error which is beyond + 2 units is omitted penalize ( ½ mk)

(c) Moles of B in 15cm3 ✓1/2

=7.5 x 10-3mol

250cm3 7.5 x 10-3 mol

25cm3 ?

=🗸 ½

(d) 🗸2

|  |  |  |
| --- | --- | --- |
| Question 2(a) |  |  |
|  | Observation | Inferences |
| 2 (a) (i) | Blue residue colourless filtrate. ✓1 | Cu2+ present✓1  Any other observation penalize |
| (ii) | No effervescence/No bubbles✓1 | Absence of SO32- or CO32-✓1 |
| (iii) | White ppt soluble in excess. ✓1 | Zn2-, Pb2+ or Al3+  for all 3 give 1 mark, 2 give ½ mk |
| (iv) | White ppt insoluble in excess. ✓1 | Pb2+ or Al3+ ✓1  Accept Zn2+ absent ( ½ mk) |
| (v) | White ppt formed 🗸 ½ | SO42- present, penalize fully if SO32- , CO32- mentioned as present 🗸 ½ |
| (b) (i) | Burns with a luminous sooty /smoky flame✓1 | —C≡C—  ✓1  Long chain hydrocarbon present |
| (ii) | soluble in water forming a colorless solution✓1 | Polar hydrocarbon✓1 |
| (iii) | KMnO4 solution remain purple. Rej. Solution turns purple , solution remains purple✓1 | —C≡C—    Absent. ✓1 |
| (iv) | pH=5.0  Penalties  Reject pH value below 4.0  Reject value in words  Accept pH value range pH value range 4.0 – 6.5✓1 | Week acid, 1mk  Accept –COOH-  Reject words such as acid/acidic organic acid/H+ ions If the term “weak” is not mentioned penalize fully✓1 |