2020 FORM 4 TERM 1 OPENER EXAMS

CHEMISTRY PP. 3 (MARKING SCHEME)

	I	II	III
Final burette reading (cm^3)	20.5	20.5	20.5
Initial burette reading(cm^3)	0.0	0.0	0.0
Volume of solution W used (cm^3)	20.5	20.5	20.5

a) i) Average volume = $\frac{20.5 + 20.5 + 20.5}{3}$

= $20.5cm^3$ (1mk)

ii) 0.1 moles in $1000cm^3$

? $20.5cm^3$

$\frac{1.1 \times 20.5}{1000}$ (1mk)

= 0.00205 moles (1mk)

b) i) Mole ratio HCl : $Na_2CO_3 . XH_2O$

2 : 1

Moles of D = $\frac{0.00205}{2}$ (1mk)

= 0.00103 moles (1mk)

ii) 0.00103 moles in $25cm^3$

? $250cm^3$

$\frac{0.00103 \times 250}{25}$ (1mk)

= 0.0103 moles (1mk)

iii) 0.0103 moles in $250cm^3$

? $1000cm^3$

= $\frac{0.0103 \times 1000}{250}$ (1mk)

= 0.0412M (1mk)

iv) 2.86g in $250cm^3$

? $1000cm^3$ (1mk)

= 11.4 g/litre

0.04 = $\frac{11.4}{mm}$ (1mk)

mm = $\frac{11.4}{0.04}$

= 286 (1mk)

v) Rmm of Na_2CO_3 = (23 x 2) + 12 + (16 x 3) = 106 (1mk)

Mass of water = 286 – 106 = 180g (1mk)

vi) $XH_2O = 180$

Rmm of H_2O = (1 x 2) + 16 (1mk)

= 18

$\frac{18x}{18} = \frac{180}{18}$

X = 10 (1mk)

2. (i)

Observation	Inferences
The solid dissolved to form a colourless solution (1mk)	Soluble salt (1mk)

ii)

Observation	Inferences
In few drops white precipitate is formed which dissolves in excess (1mk)	$Zn^{2+}Pb^{2+}$ and Al^{3+} present (1mk)

iii)

Observation	Inferences
In few drops white precipitate is formed which dissolves in excess (1mk)	Zn^{2+} present (1mk)

iv)

Observation	Inferences
White precipitate is formed which does not dissolve on warming (1mk)	CO_3^{2-} , SO_3^{2-} or SO_4^{2-} present (1mk)

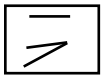
v)

Observation	Inferences
The white precipitate remains (1mk)	SO_4^{2-} present (1mk)

b)

i)

Observation	Inferences
It burns with a yellow sooty flame (1mk)	C = C or -C = C- present (1mk)



ii)

Observation	Inferences
Dissolves to form a colourless solution (1mk)	Polar compound (1mk)

iii)

Observation	Inferences
pH (4or 5) (1mk)	Weakly acidic (1mk)

iv)

Observation	Inferences
There was effervescence (1mk)	Presence of H^+ (1mk)

v)

Observation	Inferences
The purple colour of the solution persists (1mk)	-C=C- or -C = C- absent (1mk)