

PHYSICAL SCIENCES P2 (CHEMISTRY)

COMMON TEST

JUNE 2019

MARKING GUIDELINE

NATIONAL SENIOR CERTIFICATE

GRADE 11

TIME: 2 hours

MARKS: 100

This marking guideline consists of 7 pages.

QUESTION 1

1.1. C ✓✓

1.2. B ✓✓

1.3. A ✓✓

1.4. D ✓✓

1.5. C ✓✓

1.6. B ✓✓

1.7. A $\checkmark\checkmark$ 7x2 = (14)

QUESTION 2

2.1.1 A \checkmark and I \checkmark (2)

2.1.2. (B and F) \checkmark OR (D and F) (2 or 0) (2)

2.1.3. G ✓ (1)

2.1.4. G√ (1)

2.1.5. C ✓ (1)

2.1.6. E ✓ (1)

2.2 H₂O has hydrogen bonding ✓ and H₂S has dipole- dipole forces. ✓ The intermolecular forces in water are stronger ✓ Therefore more energy is required to break the IMF

in water. ✓ (4)

2.3.

H × • HוC•× H • * H ✓✓ (2)

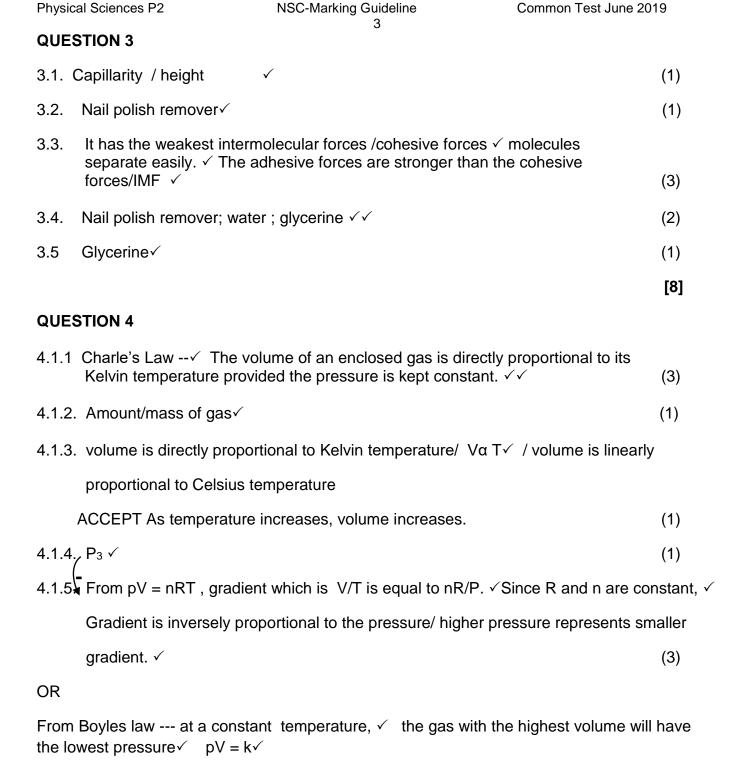
2.4.1, NON- POLAR√

GO₂ is a symmetrical molecule with even distribution of electrons

There is no net dipole moment/dipoles cancel out√/. There is no distinct opposite positive and negative ends. (3)

2.4.2 London forces ✓ (1)

[18]



4.2.

OPTION 1

Change in pressure = 100-55 = 45kPa√

pV = nRT√

 $45 \times 10^3 \times 10 \times 10^{-3} \checkmark = n \times 8.31 \times 298 \checkmark$

 $n = 0.182 \text{mol} \checkmark$

 $n = m/M\sqrt{}$

0.182 = m/32

 $m = 5.824g \checkmark of O_2 is lost$

NB: ACCEPT p values in kPa with V values in dm3

OPTION 2

pV = nRT√

 $100 \times 10^3 \times 10 \times 10^{-3} = n \times 8.31 \times 298$

n= 0.404mol (original no. of moles of oxygen in vessel)

pV = nRT

 $55 \times 10^3 \times 10 \times 10^{-3} = n \times 8.31 \times 298$

n= 0.222mol (no of mol in vessel after leak is repaired)

no of moles of gas leaked =0.404 - 0.222

= 0.182mol√

 $n = m/M\sqrt{}$

0.182 = m/32

 $m = 5.824g \checkmark of O_2 is lost$

(8)

[17]

QUESTION 5

5.1 Simplest whole number ratio in which elements in a compound combine √√ (2)5.2.

Element	Mass per 100 g	n=m/M(mol)	Simplest ratio	
С	54.56	54.56/12 = 4.547√	4.547/2.2725 = 2	
Н	9.08√	9.08/1 = 9.08√	9.08/2.2725 = 4	
0	36.36	36.36/16 = 2.2725√	2.2725/2.2725 = 1	

Empirical formula is C₂H₄O√

(6)

5.3 n = True M_r / Empirical M_r

= 132/44

= 3√

Molecular formula is C₆ H₁₂ O₃√ (award both marks if answer correct without calculation)

(2)

[10]

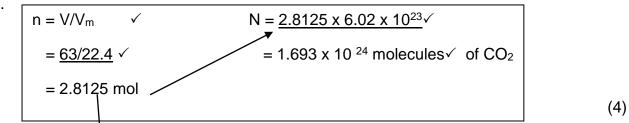
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QUESTION 6

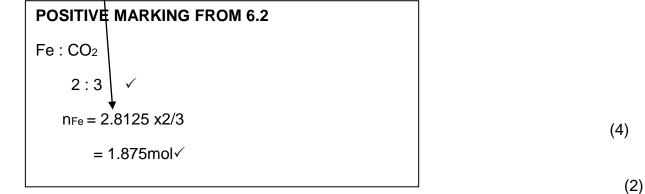
6.1. The amount of substance having the same number of particles as there are atoms in 12g of C-12. $\checkmark \checkmark /$ Amount of substance having 6,02 x 10²³ elementary particles.

(2)

6.2.



6.3



6.4.

Positive marking form 6.2/6.3 CO₂: Fe₂O₃ OR Fe : Fe_2O_3 3:1 2:1 $nFe_2O_3 = 2.8125/3\sqrt{}$ $nFe_2O_3 = 1.875/2$ = 0.9375 mol= 0.9375 mol $mFe_2O_3 = nM$ $= 0.9375 \times 160 \checkmark$ (4) = 150 g[12] % purity = $150/160 \times 100$ \sqrt{ **=** 93,75% ✓

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(2)

QUESTION 7

7.1 Substance that is used up completely in a reaction. ✓ ✓

7.2

Ratio	5	1	5	2
Moles	Ca	V ₂ O ₅	CaO	V
Initial	500√	175 ✓	0	0
Change	500√	100	500	200√
End	0	75	500	200

 V_2O_5

n = m/M n = m/M

= 20 000/40 = 31 850/182

= 500 mol = 175mol

 n_V formed = 200 mol

m = nxM

= 200 x 51√

 $= 10\ 200\ g\ \checkmark$ (6)

7.3 % yield = $8670/10\ 200\ x\ 100$ \(\sqrt{}

= 85 %√ (2)

[10]

QUESTION 8

8.1 Amount of solute per litre of solution. ✓ ✓ (2)

8.2. n = m/M

8.3 Positive marking from 8.2.

 $V = 1,20 \text{ dm}^3 \checkmark$ (3)

8.4

Positive marking from 8.3

$$C_1V_1 = C_2V_2 \checkmark$$

 $0.05 \times 1.20 \checkmark = C_2 \times 1.45 \checkmark$

 $C_2 = 0.04 \text{ mol.dm}^{-3} \checkmark$

Positive marking from 8.2. and 8.3

$$c = n/V \checkmark$$

c= 0.04 mol.dm⁻³√

(4) [11]

TOTAL MARKS : 100