Practice Question Set For A-Level
Subject : Chemistry
Paper-2 Topic: Chemical Equilibria, Le Chatelier's Principle And Kc

Merit Minds
www.merit-minds.com
Exam Preparation and Free Resources

Name of the Student:_____
Max. Marks : 28 Marks **Time : 28 Minutes**

Mark Schemes

Q1.

(a) Forward and backward reactions proceeding at equal rate

1

Amount (Conc or moles or proportion) of reactants and products remain constant

Not "reactants and products have equal conc"

1

(b) **M1** $\frac{[R]^2}{[P][Q]^2}$

Allow ( ) but must have all brackets
*If Kc wrong can only score **M3** (process mark)*
for dividing both R and P by volume)

1

(c) **M2** $[Q]^2 = \frac{[R]^2}{k_c[P]}$

Rearrangement of correct Kc expression
*If wrong Kc used can only score **M3** for correct use of vol*
*If wrong rearrangement can only score max 2 for **M3** and **M5** for correct √*

1

M3 $[Q]^2 = \frac{(5.24/10)^2}{68.0 \times (3.82/10)}$

Process mark for dividing both R and P by volume even in incorrect expression
*If vol missed can only score max 2 for **M2** and M5 for correct √*
*If vol used but then wrong maths can score **M2 M3** and **M5** for correct √*
If moles used wrongly, eg (2 × 5.24) or (5.24 × 10/10^3)
*can only score **M2** and **M5***

1

M4 $[Q]^2 = 0.0106$

Correct calculation of Q^2

1

M5 $[Q] = 0.10(3)$

Correct taking of √

Downloaded from www.merit-minds.com

1

(c) cont.

Wrong rearrangement and no use of volume

0

Wrong rearrangement

*For Correct use of volume **M3** and Correct taking of square root **M5***

2 max

No use of volume

2 max

answer = 0.325

Ignore subsequent multiplying or dividing by 10.

***0.0325 or 3.25** still score max 2*

*For Correct rearrangement **M2** and*

*Correct taking of square root **M5***

2 max

Use of volume but maths error e.g. using $(5.24)^2/10$
when should be $(5.24/10)^2$

Scores 3

also giving answer 0.325

*for **M2**, **M3** and **M5***

3

Use of volume but Q/10 also used
or Q multiplied by 10 at end
(i.e.muddling moles with concentration)

Gives answer 1.03

*For Correct rearrangement **M2** and*

*Correct taking of square root **M5***

2 max

Wrong use of moles, e.g (5.24×2) or $(5.24 \times 10/10^3)$

*For Correct rearrangement **M2** and*

*Correct taking of square root **M5***

2 max

Wrong Kc used, e.g. missing powers

*For Correct use of volume **M3***

1 max

(d) Increase or more or larger

Allow moves to left

1

(e) Increase or more or larger

Allow moves to left

1

(f) Decrease or less or smaller

NOT allow moves left

1

(g) No effect or unchanged or none

1

Downloaded from www.merit-minds.com

(h) 0.0147 or 0.0148 or 1.47×10^{-2} or 1.48×10^{-2}

Allow 0.015 or 1.5×10^{-2}

If not 0.0147, look at (c) for conseq correct use of their [Q] in new Kc = $1.39 \times [Q]^2$

Not allow just 1/68.0

ignore units

1

[24]

Downloaded from www.merit-minds.com

Q2.

(a) = (0.0745) × (0.0813) / (0.0424) × (0.0525)
= 2.72

Allow answer only without working if correct.

Lose this mark if the wrong K_c expression is used.

1

Answer, whether or not correct, given to three significant figs

Do not expect conversion from moles to concentration but allow if shown.

1

(b) Less acid is present (so less NaOH needed)

1

Equilibrium would shift to right (side with more ester / less acid)

1

[4]

Downloaded from www.merit-minds.com