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

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Name of the Student:_____
Max. Marks : 21 Marks **Time : 21 Minutes**

Mark Schemes

Q1.

(a) Mol of **E** 1.6(00)

Ignore extra zeros.

1

Mol of **F** 0.2(00)

1

(b) $K_c = \dfrac{[G]^2}{[E][F]^2}$

Penalise expression containing V.
Penalise missing brackets or ( ).

1

$mol^{-1}\ dm^3$

If K_c wrong, allow units consequential to their K_c, but no marks in (c) unless correct K_c used in (c).

1

(c) $K_c = \dfrac{(0.85/1.5)^2}{(2.50/1.5)(1.20/1.5)^2}$

Vol missed or used wrongly – no marks.
If K_c correct in (b) but squared term missed here, no further marks.

1

= 0.3(01) Allow 0.299−0.304

Ignore units.

1

(d) M1 Decrease

If M1 is incorrect CE=0 for the clip.
If M1 is blank, mark on and seek to credit the correct information in the explanation.

1

M2 More moles on LHS / reactants or fewer / less moles on RHS / products (allow correct ratio 3:2)

M2 not just a generic statement 'shifts to more moles'.

1

M3 (Equilibrium) <u>shifts / moves</u> either to oppose reduction in pressure / or to increase the pressure

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M3 depends on a correct statement for M2.

Not 'favours'.

Allow 'to oppose change' only if reduction in pressure noted.

1

(e) M1 T_1

If M1 is incorrect, CE=0 for the clip.

If M1 is blank, mark on and seek to credit the correct information in the explanation.

1

M2 (Forward*) reaction is <u>exothermic</u>

OR <u>Backward</u> reaction is <u>endothermic</u>

**Assume answer refers to forward reaction unless otherwise stated.*

1

M3 (at T_2 or lower temperature)

(Equilibrium) <u>shifted / moved</u> to oppose reduction in temp

OR

at T_1 or higher temp, (Equilibrium) <u>shifted / moved</u> to oppose (increase in temp)

M3 depends on a correct statement for M2

Allow "to oppose change" only if change in temperature is stated.

Not 'favours'.

1

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Q2.

(a) Cl_2 0.4

1

NOCl 1.7

1

(b) (i) $K_c = \dfrac{[NO]^2[Cl_2]}{[NOCl]^2}$

Penalise expression containing V
Allow ( ) here, but must have all brackets.
If K_c expression wrong, max 2 in (b)(ii) for
M1 for correct rearrangement of their K_c and
M4 for multiplying by 15

1

(ii) M1 $[Cl_2] = K_c \times \dfrac{[NOCl]^2}{[NO]^2}$

Mark is for rearrangement of correct K_c expression.
If K_c rearrangement wrong, can only score max 2 for:
M3 and M4

1

M2

$$[Cl_2] = \frac{(7.4\times10^{-3})\times(1.90/15)^2}{(0.86/15)^2} \left(= \frac{(7.4\times10^{-3})\times(0.127)^2}{(0.0573)^2}\right)$$

Rounding 1.90 / 15 wrongly to 0.126 is AE

1

M3 $[Cl_2]$ = 0.0361 to 0.0365 (min 2 sfs)

Mark for correct calculation of $[Cl_2]$

1

M4 mol Cl_2 = 0.54 to 0.55

Correct answer scores 4 ignore working

Mark is for <u>answer</u> of (M3 × 15)

1

(iii) ($\sqrt{}$ • (7.4×10^{-3}) =) 0.086

Allow 0.085 to 0.086)

*Mark for answer **OR** conseq on their Cl_2*

$$K_c = \sqrt{\frac{M4}{15}} \times \frac{0.86}{1.90} = \sqrt{M4} \times 0.117$$

Or $\sqrt{M3} \times 0.453$

1

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$\underline{\text{mol}^{\frac{1}{2}}\ \text{dm}^{-3/2}}$ ***OR*** $\underline{\text{mol}^{0.5}\ \text{dm}^{-1.5}}$

NOT $\sqrt{\text{mol dm}^{-3}}$ nor $(\text{mol dm}^{-3})^{1/2}$

1

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