

Name of the Student: _____

Max. Marks : 16 Marks

Time : 16 Minutes

Mark Schemes

Q1.

B

[1]

Q2.

- (a) M1 $K_p = (p_Y)^3 \cdot (p_Z)^2 / (p_W)^2 \cdot (p_X)$ NB [] wrong 1
- M2 temperature 1
- M3 increase 1
- M4 particles have more energy or greater velocity/speed 1
- M5 more collisions with $E > E_a$ or more successful collisions 1
- M6 Reaction exothermic or converse 1
- M7 Equilibrium moves in the left 1

Marks for other answers

Increase in pressure or concentration	allow M1, M5, M6	Max 3
Addition of a catalyst;	allow M1, M5, M6	Max 3
Decrease in temperature;	allow M1, M2, M6	Max 3
Two or more changes made;	allow M1, M6	Max 2

- (b) (i) Advantage; reaction goes to completion, not reversible or faster 1

Disadvantage; reaction vigorous/dangerous
(exothermic must be qualified)

or HCl(g) evolved/toxic
or CH₃COCl expensive

NB Allow converse answers

Do not allow reactions with other reagents e.g. water or ease of separation

1

- (ii) $\Delta S = \Sigma S \text{ products} - \Sigma S \text{ reactants}$ 1

$$\Delta S = (259 + 187) - (201 + 161)$$

1

$$\Delta S = 84 \text{ (JK}^{-1} \text{ mol}^{-1}) \quad (\text{Ignore units})$$

Allow – 84 to score **(1)** mark 1

$$\Delta G = \Delta H - T\Delta S$$

1

$$= -21.6 - 298 \times 84/1000$$

$$= -46.6 \text{ kJ mol}^{-1} \text{ or } -46\,600 \text{ J mol}^{-1}$$

1

Allow **(2)** for – 46.6 without units

(Mark ΔG consequentially to incorrect ΔS)

(e.g. $\Delta S = -84$ gives $\Delta G = +3.4 \text{ kJ mol}^{-1}$)

1

[15]