



1-5: C D B C D

6-10: A B A D A

11-15: C A C A B

16-20: B D A A B

21-25: B A D C B

26-30: D D A C D

31-35: C B C B D

36-40: D D D A B

41-45: B A A B A

46-50: B B C C C

51-55: C B B C C

56-60: A B D A C

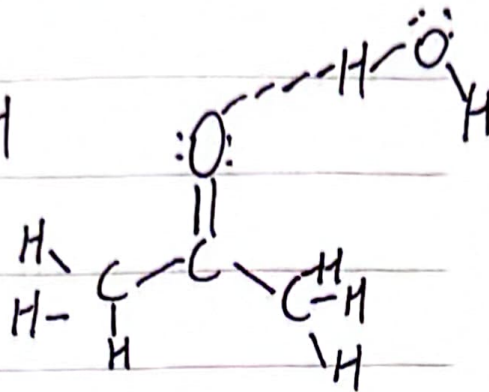
1. (a) 9

1

(b) (i) $P_2 = 0.853 \text{ atm}$

(ii) $\frac{1}{2}$

(c) (i) $\text{H}-\ddot{\text{O}}-\text{H}$



(ii) The intermolecular force between CH_3OD and water leads to a decrease in pressure which is lower than the predicted value

(d) it is first order with respect to $\text{C}_3\text{H}_6\text{O}$

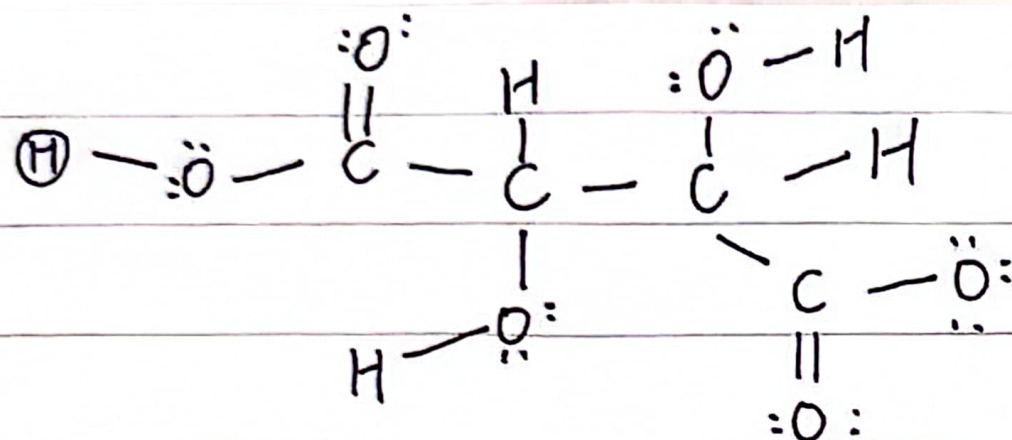
(e) $\text{rate} = k[\text{H}_3\text{O}^+]$

(f) $k = 3 \times 10^5 \times \text{M}^{-1}\text{s}^{-1}$

(g) The increase in collision frequency at low temperatures leads to a decrease in the rate constant

(h) This reaction is relative to BHOD and HBD and is an advanced arrangement relative to M

(a)



(b) 6

(c) Equal to the equilibrium constant

(d) Solid KHCH_4DIs

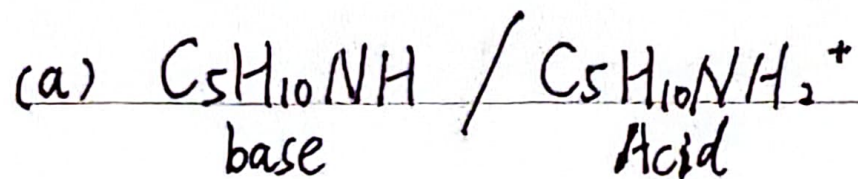
(e) (i) 9.5 ml

(ii) $[\text{HC}_4\text{H}_4\text{O}_6^-] = 0.11 \text{ M}$

(iii) $[\text{K}^+] = 9.67 \times 10^{-4}$

(f) (i) $\text{KHC}_4\text{H}_4\text{O}_6(\text{s}) \rightleftharpoons \text{K}^+(\text{aq}) + \text{HC}_4\text{H}_4\text{O}_6^-(\text{aq})$

(ii) The calculated value of K_{ip} will be greater than the K_{sp} value obtained by the first student.



(f) (ii)

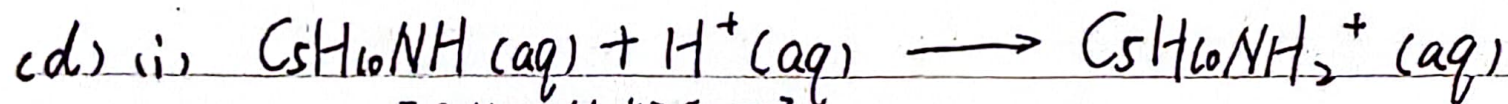
~~$\Delta H^\circ_{\text{rxn}} = 30$~~

(b) $K_b = \frac{[\text{C}_5\text{H}_{10}\text{NH}_2^+][\text{OH}^-]}{[\text{C}_5\text{H}_{10}\text{NH}]}$

$\Delta H^\circ_{\text{rxn}} = \Delta G^\circ_{\text{rxn}} + T\Delta S^\circ_{\text{rxn}} <$

(c) (i) $\text{pH} = 16$

(ii) 6%



(ii) $Q = \frac{[\text{C}_5\text{H}_{10}\text{NH}_2^+][\text{OH}^-]}{[\text{C}_5\text{H}_{10}\text{NH}]}$ $Q < K$

(e) (i) The magnitude of rate of change of $\text{H}_2(\text{g})$ is Three
~~three times~~ times the magnitude of the rate of change
of $\text{C}_5\text{H}_{10}\text{NH}$.

(ii) $\text{H}_2\text{g} = 1.46 \text{ atm}$

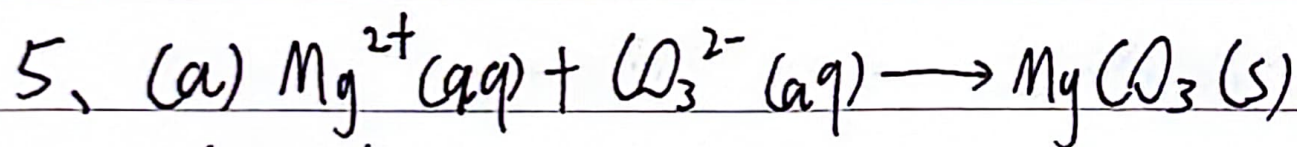
(f) (i) So fewer gaseous molecules in the products compared to the reactants results in negative $\Delta S^\circ_{\text{rxn}}$

4. (a) The lid is important because it prevents the heat into the surroundings

(b) The temperature of the water

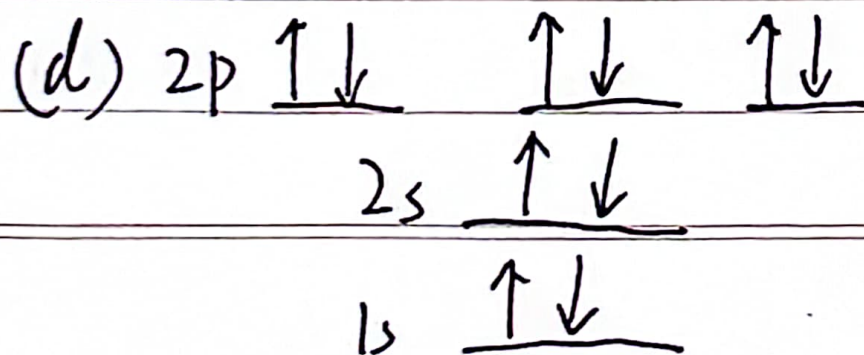
(c) $q = 3.9 \times 10^5 \text{ J}$

(d) $\Delta H^\circ_{\text{solution}} = 0.56 \text{ kJ/mol}$



(b) Flame test

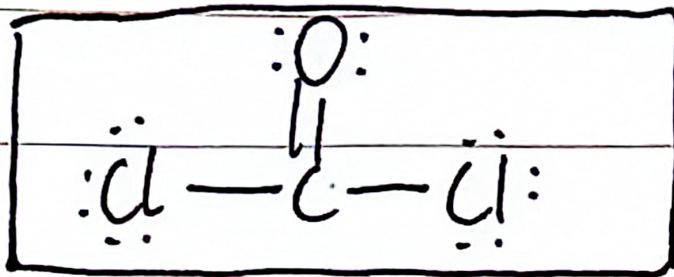
(c) K



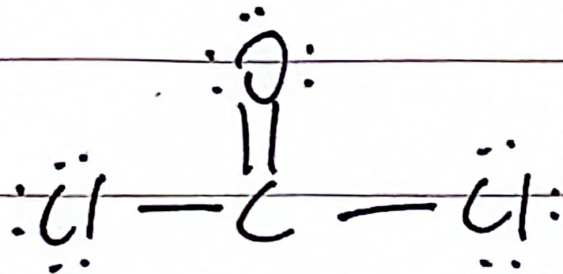


(c) $I = 0.63\text{A}$

7. (a)



(b)



(c) $E = 453\text{K}$