Polytechnic Tutoring Center
Midterm II REVIEW – CM 1024, Spring 2020

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ANSWER KEY

1. pH = 7.19; Find concentrations after mixing, use Hasselbach equation to solve for pH

2. pH - 9.11; Use definition of Kw to solve for Kb, plug into Kb equation to solve for concentration of OH. Calculate pOH and subtract from 14 to find pH

3. \( \text{H}_2\text{CO}_3 \text{ (aq)} = 0.0037\text{M} \)

\( \text{HCO}_3^- \text{ (aq)} = 4.0 \times 10^{-5} \text{M} \)

\( \text{CO}_3^{2-} \text{ (aq)} = 5.6 \times 10^{-11} \text{M} \)

\( \text{H}^+ \text{ (aq)} = 4.0 \times 10^{-5} \text{M} \)

pH = 4.40

4. .68%, pKb=4.74; ICE table, assume %5 rule, plug into Kb expression

5. Q = 1, [H\(_2\)] = [I\(_2\)] = .066M, [HI] = .528M; ICE table and plug into expression for Kc

6. P\(_{co}\) = .92 atm; Make an ICE table, use expression for Kp and dalton’s law

7. Kc = .139, Kp = 14; use equation for Kp as a function of Kc

8. T = 770s; use equation for decay and set A\(_0\) to .125A

9. 7.6; clapeyron equation

10. Worked on the board

   a) \(2\text{NO} + \text{H}_2 \rightarrow \text{H}_2\text{O} + \text{N}_2\text{O} \)

   b) \( \text{ra} = k \ [\text{NO}]^2 \)

   c) \( \text{ra} = (k_1 k_2 / k_{-1}) \ [\text{NO}]^2 / [\text{H}_2] \)

   d) \((k_1 k_2 [\text{H}_2] [\text{NO}]^2) / (k_{-1} + k_2 [\text{H}_2])\)