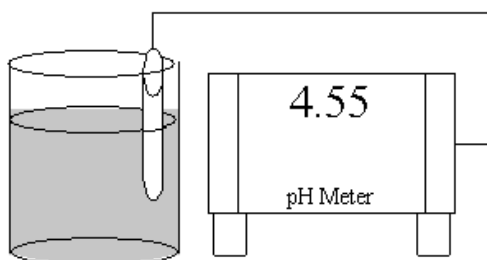


- For which of the following equilibria does K_c correspond to the acid-ionization constant, K_a , of HC_2O_4^- ?
 - $\text{H}_2\text{C}_2\text{O}_4(aq) + \text{H}_2\text{O}(l) \rightleftharpoons \text{H}_3\text{O}^+(aq) + \text{HC}_2\text{O}_4^-(aq)$
 - $\text{HC}_2\text{O}_4^-(aq) + \text{H}_2\text{O}(l) \rightleftharpoons \text{H}_2\text{C}_2\text{O}_4(aq) + \text{OH}^-(aq)$
 - $\text{HC}_2\text{O}_4^-(aq) + \text{H}_3\text{O}^+(aq) \rightleftharpoons \text{H}_2\text{C}_2\text{O}_4(aq) + \text{H}_2\text{O}(l)$
 - $\text{HC}_2\text{O}_4^-(aq) + \text{H}_2\text{O}(l) \rightleftharpoons \text{H}_3\text{O}^+(aq) + \text{C}_2\text{O}_4^{2-}(aq)$
 - $\text{HC}_2\text{O}_4^-(aq) + \text{OH}^-(aq) \rightleftharpoons \text{C}_2\text{O}_4^{2-}(aq) + \text{H}_2\text{O}(l)$
- What is the pH of a 0.035 M solution of benzoic acid ($K_a = 6.3 \times 10^{-5}$) at 25°C?
 - 6.51
 - 2.83
 - 5.66
 - 5.20
 - 1.46
- In a 0.20 M solution of a diprotic acid H_2A ($K_{a1} = 5.6 \times 10^{-5}$, $K_{a2} = 9.9 \times 10^{-10}$ at 25°C), what is the equilibrium concentration of A^{2-} ?
 - 0.20 M
 - 0.40 M
 - 3.3×10^{-3} M
 - 1.4×10^{-5} M
 - 9.9×10^{-10} M
- What is the hydronium-ion concentration of a 0.190 M oxalic acid, $\text{H}_2\text{C}_2\text{O}_4$, solution? For oxalic acid, $K_{a1} = 5.6 \times 10^{-2}$ and $K_{a2} = 5.1 \times 10^{-5}$.
 - 7.9×10^{-2} M
 - 3.1×10^{-3} M
 - 1.0×10^{-1} M
 - 3.1×10^{-3} M
 - 1.0×10^{-7} M
- A solution of aniline ($\text{C}_6\text{H}_5\text{NH}_2$, $K_b = 4.2 \times 10^{-10}$) has a pH of 8.79 at 25°C. What was the initial concentration of aniline?
 - 6.2×10^{-6} M
 - 7.8×10^{-9} M
 - 1.6×10^{-9} M
 - 9.1×10^{-2} M
 - 4.2×10^{-10} M
- Saccharin is a weak organic base with a K_b of 4.8×10^{-3} . A 0.488-g sample of saccharin dissolved in 45.0 mL of water has a pH of 12.17. What is the molar mass of saccharin?
 - 159 g/mol
 - 33.4 g/mol
 - 183 g/mol
 - 108 g/mol
 - 0.325 g/mol

7. A 0.0868 M solution of a weak base has a pH of 9.04. What is the identity of the weak base?

Weak Base	K_b	
Ethylamine ($\text{CH}_3\text{CH}_2\text{NH}_2$)	4.7×10^{-4}	
Hydrazine (N_2H_4)	1.7×10^{-6}	a) pyridine
Hydroxylamine (NH_2OH)	1.1×10^{-8}	b) ethylamine
Pyridine ($\text{C}_5\text{H}_5\text{N}$)	1.4×10^{-9}	c) hydrazine
Aniline ($\text{C}_6\text{H}_5\text{NH}_2$)	4.2×10^{-10}	d) hydroxylamine
		e) aniline

8. Which of the following salts is most likely to form an aqueous solution having the pH shown in the figure below?



- a) K_2CO_3
b) LiNO_3
c) NaBr
d) NH_4Cl
e) RbCN

9. What is K_a for the ethylammonium cation, $\text{C}_2\text{H}_5\text{NH}_3^+$, at 25°C ? (K_b for $\text{C}_2\text{H}_5\text{NH}_2 = 4.7 \times 10^{-4}$ at 25°C .)
- a) 4.7×10^{-18}
b) 4.7×10^{-4}
c) 4.7×10^{10}
d) 2.1×10^{-11}
e) 1.0×10^{-7}
10. A 5.96-g sample of homogentisic acid, a weak organic acid having $K_a = 4.0 \times 10^{-5}$, is dissolved in 35.0 mL of water and its pH is measured to be 2.20. What is the molar mass of homogentisic acid?
- a) 170 g/mol
b) 939 g/mol
c) 5.89 g/mol
d) 168 g/mol
e) 1.01 g/mol

END

Please note that the quiz is open book, you may discuss these questions with your classmates only. You are NOT supposed to discuss any of these questions with your tutor or with a faculty member. Correct answers will be filled on a scantron and handed in by Friday April 21, 2012 in class at 8:00am. I will be handing out blank scantrons in class on Wednesday.