Faculty Submitting: _Grinias_____

Specify here whether "Pre" or "End" of Unit and the Unit #: ____End Unit 14_____

Unit 14_ Question 1	**Canvas Question Type:** Formula Question
	Question Text What is [H_3O^+] (in mM) in a solution of [a] *M* CH_3CO_2H and [b] *M* $NaCH_3CO_2$? $CH_3CO_2H(aq)+H_2O(l)\rightleftharpoons H_3O^+(aq)+CH_3CO_2^-(aq)$ $K_a=1.8\times10^{-5}$
	Formula: (0.018*a)/b **Parameters:** Let [a] = 0.200 – 0.300 (vary by 0.001) and let [b] = 0.015 – 0.035 (vary by 0.001).
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Unit 14_ Question 2	**Canvas Question Type:** Formula Question
	Question Text What is the pH of a solution of [a] *M* CH_3CO_2H and [b] *M* $NaCH_3CO_2$? $CH_3CO_2H(aq)+H_2O(l)\rightleftharpoons H_3O^+(aq)+CH_3CO_2^-(aq)$ $K_a=1.8\times10^{-5}$
	Formula: $-\log_{10}((0.000018*a)/b)$ **Parameters:** Let [a] = 0.200 – 0.300 (vary by 0.001) and let [b] = 0.015 – 0.035 (vary by 0.001).
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Unit 14_ Question 3	**Canvas Question Type:** Formula Question
	Question Text What is [OH^-] (in mM) in a solution of [a] *M* CH_3NH_2 and [b] *M* CH_3NH_3Cl? $CH_3NH_2(aq)+H_2O(l)\rightleftharpoons CH_3NH_3^+(aq)+OH^-(aq)$ $K_b=4.4\times10^{-4}$
	Formula: (0.44*a)/b **Parameters:** Let [a] = 0.110 – 0.140 (vary by 0.001) and let [b] = 0.110 – 0.140 (vary by 0.001).
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Unit 14_ Question 4	**Canvas Question Type:** Formula Question
	Question Text What is the pOH of a solution of [a] *M* CH_3NH_2 and [b] *M* CH_3NH_3Cl? $CH_3NH_2(aq)+H_2O(l)\rightleftharpoons CH_3NH_3^+(aq)+OH^-(aq)$ $K_b=4.4\times10^{-4}$

	Formula: $-\log_{10}(0.00044*a)/b$ **Parameters:** Let [a] = 0.110 – 0.140 (vary by 0.001) and let [b] = 0.110 – 0.140 (vary by 0.001).
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Unit 14_ Question 5	**Canvas Question Type:** Formula Question
	Question Text What is the pH of a solution of [a] *M* CH_3NH_2 and [b] *M* CH_3NH_3Cl? $CH_3NH_2(aq)+H_2O(l)\rightleftharpoons CH_3NH_3^+(aq)+OH^-(aq)$ $K_b=4.4\times10^{-4}$
	Formula: $14+\log_{10}(0.00044*a)/b$ **Parameters:** Let [a] = 0.110 – 0.140 (vary by 0.001) and let [b] = 0.110 – 0.140 (vary by 0.001).
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Unit 14_ Question 6	**Canvas Question Type:** Drop down **GROUP, choose 1**
6a	**Question Text** A common buffer involves the use of acetic acid and sodium acetate. Will the concentration of acetate ion go up or down if a small volume of HCl is added to a buffer solution containing acetic acid and sodium acetate?
	Correct Answwer: Down **Wrong Answers:** Up
6b	**Question Text** A common buffer involves the use of acetic acid and sodium acetate. Will the concentration of acetic acid go up or down if a small volume of HCl is added to a buffer solution containing acetic acid and sodium acetate?
	Correct Answwer: Up **Wrong Answers:** Down
Unit 14_ Question 7 a	**Question Text** A common buffer involves the use of acetic acid and sodium acetate. Will the concentration of acetate ion go up or down if a small volume of NaOH is added to a buffer solution containing acetic acid and sodium acetate?
	Correct Answwer: Up **Wrong Answers:** Down
7b	**Question Text** A common buffer involves the use of acetic acid and sodium acetate. Will the concentration of acetic acid go up or down if a small volume of NaOH is added to a buffer solution containing acetic acid and sodium acetate?

	Correct Answwer: Down **Wrong Answers:** Up
Unit 14_ Question 8 a	**Question Text** A common buffer involves the use of ammonia and ammonium nitrate. Will the concentration of ammonia go up or down if a small amount of HCl is added to a buffer solution containing ammonia and ammonium nitrate?
	Correct Answwer: Down
8b	**Question Text:** A common buffer involves the use of ammonia and ammonium nitrate. Will the concentration of ammonium ion go up or down if a small amount of HCl is added to a buffer solution containing ammonia and ammonium nitrate?
	Correct Answwer: Up
Unit 14_ Question 9 a	**Question Text:** A common buffer involves the use of ammonia and ammonium nitrate. Will the concentration of ammonia go up or down if a small amount of NaOH is added to a buffer solution containing ammonia and ammonium nitrate?
	Correct Answwer: Up
9b	**Question Text:** A common buffer involves the use of ammonia and ammonium nitrate. Will the concentration of ammonium ion go up or down if a small amount of NaOH is added to a buffer solution containing ammonia and ammonium nitrate?
	Correct Answwer: Down
Unit 14_ Question 10 a	**Question Text:** A common buffer involves the use of ammonia and ammonium nitrate. Will the pH go up or down if a small amount of HCl is added to a buffer solution containing ammonia and ammonium nitrate?
	Correct Answer: Down
10b	**Question Text:** A common buffer involves the use of ammonia and ammonium nitrate. Will the pH go up or down if a small amount of NaOH is added to a buffer solution containing ammonia and ammonium nitrate?
	Correct Answer: Up
Unit 14_ Question 11	**Canvas Question Type:** Formula Question
11a	**Question Text** What will be the pH of a buffer solution prepared from [a] mol NH_3, [b] mol NH_4NO_3, and just enough water to give [c] L of solution? Use ionization constants from Appendices H & I to help solve this problem. **Formula**: $9.255+\log_{10}(a/b)$ **Parameters**: Let [a] = 0.15 – 0.30 (vary by 0.01), let [b] = 0.15 – 0.30 (vary by 0.01), and let [c] = 0.95 – 1.05 (vary by 0.01).
11b	**Question Text** What will be the pH of a buffer solution prepared from [a] mol sodium acetate, [b] mol acetic acid, and just enough water to give [c] L of solution? Use ionization constants from Appendices H & I to help solve this problem. **Formula:** $4.745+\log_{10}(a/b)$ **Parameters** Let [a] = 0.15 – 0.30 (vary by 0.01), let [b] = 0.15 – 0.30 (vary by 0.01), and let [c] = 0.95 – 1.05 (vary by 0.01).

Unit 14_ Question 12	**Question Text:** Calculate the pH in a titration of 40 mL (0.040 L) of 0.100 *M* barbituric acid ($K_a = 9.8 \times 10^{-5}$) with 0.100 *M* KOH after [a] mL of 0.100 *M* KOH have been added.
	Formula: $4.01 + \log_{10}((40-a)/a)$ **Parameters** Let [a] = 10.0 – 35.0 (vary by 0.1)
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