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**1. chem10b 17.2-5**

Of the following solutions, which has the greatest buffering capacity?

Student Response	Correct Answer
A. 0.821 M HF and 0.909 M NaF	
B. 0.821 M HF and 0.217 M NaF	
C. They are all buffer solutions and would all have the same capacity.	
D. 0.121 M HF and 0.667 M NaF	
E. 0.100 M HF and 0.217 M NaF	

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**2. chem10b 17.1-13**

A 25.0 mL sample of 0.723 M HClO<sub>4</sub> is titrated with a 0.273 M KOH solution. The H<sub>3</sub>O<sup>+</sup> concentration after the addition of 66.2 mL of KOH is \_\_\_\_\_ M.

Student Response	Correct Answer
A. 0.723	
B. 0.273	
C. 0.439	
D. $2.81 \times 10^{-13}$	
E. $1.00 \times 10^{-7}$	

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**3. chem10b 17.5-9**

A solution is prepared by dissolving 0.23 mol of chloroacetic acid and 0.27 mol of sodium chloroacetate in water sufficient to yield 1.00 L of solution. The addition of 0.05 mol of HCl to this buffer solution causes the pH to drop slightly. The pH does not decrease drastically because the HCl reacts with the \_\_\_\_\_ present in the buffer solution. The K<sub>a</sub> of chloroacetic acid is  $1.36 \times 10^{-3}$ .

Student Response	Correct Answer
A. chloroacetate ion	
B. $\text{H}_3\text{O}^+$	
C. chloroacetic acid	
D. This is a <u>buffer</u> solution: the pH does not change upon addition of acid or base.	
E. $\text{H}_2\text{O}$	

**4. chem10b 17.5-19**

A solution of NaF is added dropwise to a solution that is 0.0144 M in  $\text{Ba}^{2+}$ . When the concentration of  $\text{F}^-$  exceeds \_\_\_\_\_ M,  $\text{BaF}_2$  will precipitate. Neglect volume changes.

For  $\text{BaF}_2$ ,

Student Response	Correct Answer
A. $1.2 \times 10^{-4}$	
B. $2.4 \times 10^{-8}$	
C. $1.1 \times 10^{-2}$	
D. $2.7 \times 10^{-3}$	
E. $5.9 \times 10^{-5}$	

**5. chem10b 17.2-6**

The addition of hydrofluoric acid and \_\_\_\_\_ to water produces a buffer solution.

Student Response	Correct Answer
A. NaF	
B. HCl	
C. $\text{NaNO}_3$	
D. NaCl	
E. NaBr	

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**6. chem10b 17.2-21**

Consider the following table of  $K_{sp}$  values.

Which compound listed below has the smallest molar solubility in water?

Student Response	Correct Answer
A. CdCO <sub>3</sub>	
B. Cd(OH) <sub>2</sub>	
C. AgI	
D. ZnCO <sub>3</sub>	
E. CaF <sub>2</sub>	

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**7. chem10b 17.2-11**

The primary buffer system that controls the pH of the blood is the \_\_\_\_\_ buffer system.

Student Response	Correct Answer
A. carbonic acid, carbon dioxide	
B. carbonic acid, bicarbonate	
C. carbon dioxide, carbonate	
D. carbonate, bicarbonate	
E. carbonate, carbonic acid	

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**8. chem10b 17.5-16**

A 25.0-mL sample of 0.150 M hydrazoic acid is titrated with a 0.150 M NaOH solution. What is the pH after 13.3 mL of base is added? The  $K_a$  of hydrazoic acid is  $1.9 \times 10^{-5}$ .

Student Response	Correct Answer
A. 1.34	

B. 4.78
C. 4.66
D. 4.45
E. 3.03

**9. chem10b 17.1-10**

The pH of a solution prepared by dissolving 0.350 mol of solid methylamine hydrochloride

in \_\_\_\_\_ of methylamine is \_\_\_\_\_. The  $K_b$  for methylamine is \_\_\_\_\_.

Student Response	Correct Answer
A. 1.66	
B. 10.2	
C. 10.6	
D. 2.86	
E. 11.1	

**10. chem10b 17.5-17**

What is the molar solubility of magnesium carbonate (  $MgCO_3$  ) in water? The solubility-product constant for  $MgCO_3$  is  $3.5 \times 10^{-8}$  at 25°C.

Student Response	Correct Answer
A. $2.6 \times 10^{-4}$	
B. 7.46	
C. $1.8 \times 10^{-8}$	
D. $7.0 \times 10^{-8}$	
E. $1.9 \times 10^{-4}$	

**11. chem10b 17.1-22**

Determine the  $K_{sp}$  for magnesium hydroxide ( $Mg(OH)_2$ ) where the solubility of  $Mg(OH)_2$  is  $1.4 \times 10^{-4}$  M.

Student Response	Correct Answer
A. $2.7 \times 10^{-12}$	
B. $1.1 \times 10^{-11}$	
C. $3.9 \times 10^{-8}$	
D. $2.0 \times 10^{-8}$	
E. $1.4 \times 10^{-4}$	

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**12. chem10b 17.2-7**

Which of the following could be added to a solution of sodium acetate to produce a buffer?

acetic acid hydrochloric acid potassium acetate sodium chloride

Student Response	Correct Answer
A. sodium chloride or potassium acetate	
B. potassium acetate only	
C. acetic acid or hydrochloric acid	
D. hydrochloric acid only	
E. acetic acid only	

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**13. chem10b 17.1-8**

Calculate the pH of a solution prepared by dissolving 0.250 mol of benzoic acid ( $C_7H_5O_2H$ )

and \_\_\_\_\_ of sodium benzoate ( $NaC_7H_5O_2$ ) in water sufficient to yield 1.00 L of solution. The  $K_a$

of benzoic acid is \_\_\_\_\_

Student Response	Correct Answer
A. 4.41	
B. 4.19	
C. 2.39	
D. 3.97	
E. 10.0	

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**14. chem10b 17.5-10**

A solution is prepared by dissolving 0.23 mol of hydrazoic acid and 0.27 mol of sodium azide in water sufficient to yield 1.00 L of solution. The addition of 0.05 mol of NaOH to this buffer solution causes the pH to increase slightly. The pH does not increase drastically because the NaOH reacts with the \_\_\_\_\_ present in the buffer solution. The  $K_a$  of hydrazoic acid is  $1.9 \times 10^{-5}$ .

Student Response	Correct Answer
A. H <sub>2</sub> O	
B. azide	
C. This is a <u>buffer</u> solution: the pH does not change upon addition of acid or base.	
D. hydrazoic acid	
E. H <sub>3</sub> O <sup>+</sup>	

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**15. chem10b 17.5-11**

How many milliliters of 0.0850 M NaOH are required to titrate 25.0 mL of \_\_\_\_\_ to the equivalence point?

Student Response	Correct Answer
A. 3.92	
B. 29.5	
C. 0.153	
D. 21.2	
E. 0.245	

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**16. chem10b 17.2-20**

Consider the following table of  $K_{sp}$  values.

Which compound listed below has the greatest molar solubility in water?

Student Response	Correct Answer
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A. AgI
B. CaF <sub>2</sub>
C. ZnCO <sub>3</sub>
D. Cd(OH) <sub>2</sub>
E. CdCO <sub>3</sub>

Score: 1/1

**17. chem10b 17.1-1**

The pH of a solution that contains 0.818 M acetic acid ( $K_a = 1.76 \times 10^{-5}$ ) and 0.172 M sodium acetate is \_\_\_\_\_.

Student Response	Correct Answer
A. 8.57	
B. 4.08	
C. 5.43	
D. 8.37	
E. 9.92	

**18. chem10b 17.2-1**

Which one of the following pairs cannot be mixed together to form a buffer solution?

Student Response	Correct Answer
A. H <sub>3</sub> PO <sub>4</sub> , KH <sub>2</sub> PO <sub>4</sub>	
B. KOH, HF	
C. NH <sub>3</sub> , NH <sub>4</sub> Cl	
D. RbOH, HBr	
E. NaC <sub>2</sub> H <sub>3</sub> O <sub>2</sub> , HCl (C <sub>2</sub> H <sub>3</sub> O <sub>2</sub> <sup>-</sup> = acetate)	

**19. chem10b 17.1-15**

The pH of a solution prepared by mixing 50.0 mL of 0.125 M KOH and 50.0 mL of 0.125 M HCl is \_\_\_\_\_.

Student Response	Correct Answer
A. 6.29	
B. 7.00	
C. 0.00	
D. 5.78	
E. 8.11	

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**20. chem10b 17.1-23**

Calculate the maximum concentration (in M) of silver ions ( $\text{Ag}^+$ ) in a solution that contains \_\_\_\_\_ of \_\_\_\_\_ The  $K_{\text{sp}}$  of  $\text{Ag}_2\text{CO}_3$  is \_\_\_\_\_

Student Response	Correct Answer
A. $8.1 \times 10^{-12}$	
B. $1.8 \times 10^{-5}$	
C. $3.2 \times 10^{-10}$	
D. $1.4 \times 10^{-6}$	
E. $2.8 \times 10^{-6}$	

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**1. chem10b 17.1-17**

A 25.0 mL sample of an HCl solution is titrated with a 0.139 M NaOH solution. The equivalence point is reached with 15.4 mL of base. The concentration of HCl is \_\_\_\_\_ M.

Student Response	Correct Answer
A. 0.0856	
B. 0.267	
C. 11.7	
D. 0.139	
E. 0.00214	



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**3. chem10b 17.5-19**

A solution of NaF is added dropwise to a solution that is 0.0144 M in  $\text{Ba}^{2+}$ . When the concentration of  $\text{F}^-$  exceeds \_\_\_\_\_ M,  $\text{BaF}_2$  will precipitate. Neglect volume changes. For  $\text{BaF}_2$ ,  $1.7 \times 10^{-6}$ .

Student Response	Correct Answer
A. $2.7 \times 10^{-3}$	
B. $2.4 \times 10^{-8}$	
C. $1.2 \times 10^{-4}$	
D. $5.9 \times 10^{-5}$	
E. $1.1 \times 10^{-2}$	

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**5. chem10b 17.2-2**

A solution containing which one of the following pairs of substances will be a buffer solution?

Student Response	Correct Answer
A. RbCl, HCl	
B. KBr, HBr	
C. CsF, HF	
D. NaI, HI	
E. none of the above	

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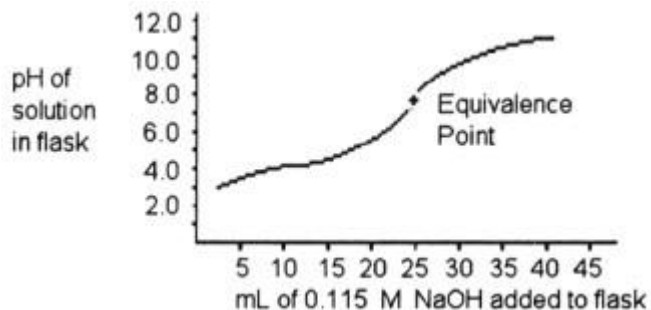
**6. chem10b 17.1-22**

Determine the  $K_{sp}$  for magnesium hydroxide ( $\text{Mg}(\text{OH})_2$ ) where the solubility of  $\text{Mg}(\text{OH})_2$  is  $1.4 \times 10^{-4}$  M.

Student Response	Correct Answer
A. $1.1 \times 10^{-11}$	
B. $2.0 \times 10^{-8}$	
C. $3.9 \times 10^{-8}$	
D. $2.7 \times 10^{-12}$	

E.  $1.4 \times 10^{-4}$

7. chem10b 17.2-16



A 25.0 mL sample of a solution of an unknown compound is titrated with a 0.115 M NaOH solution. The titration curve above was obtained. The unknown compound is \_\_\_\_\_.

Student Response	Correct Answer
A. a weak acid	
B. a strong base	
C. a weak base	
D. a strong acid	
E. neither an acid nor a base	

8. chem10b 17.2-11

The primary buffer system that controls the pH of the blood is the \_\_\_\_\_ buffer system.

Student Response	Correct Answer
A. carbonate, carbonic acid	
B. carbonic acid, carbon dioxide	
C. carbonic acid, bicarbonate	
D. carbonate, bicarbonate	
E. carbon dioxide, carbonate	

9. chem10b 17.2-29

Which one of the following is not amphoteric?

Student Response	Correct Answer
A. $\text{Al}(\text{OH})_3$	
B. $\text{Zn}(\text{OH})_2$	
C. $\text{Sn}(\text{OH})_2$	
D. $\text{Ca}(\text{OH})_2$	
E. $\text{Cr}(\text{OH})_3$	

Score: 1/1

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**10. chem10b 17.5-13**

A 25.0-mL sample of 0.150 M butanoic acid is titrated with a 0.150 M NaOH solution. What is the pH before any base is added? The  $K_a$  of butanoic acid is  $1.5 \times 10^{-5}$ .

Student Response	Correct Answer
A. 4.00	
B. $1.0 \times 10^4$	
C. 2.83	
D. $1.5 \times 10^{-3}$	
E. 4.82	

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**11. chem10b 17.1-6**

Calculate the pH of a solution prepared by dissolving 0.370 mol of formic acid ( $\text{HCO}_2\text{H}$ ) and 0.230 mol of sodium formate ( $\text{NaCO}_2\text{H}$ ) in water sufficient to yield 1.00 L of solution. The  $K_a$  of formic acid is  $1.77 \times 10^{-4}$ .

Student Response	Correct Answer
A. 3.54	
B. 2.30	
C. 3.95	
D. 10.46	
E. 2.09	

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**12. chem10b 17.1-14**

A 25.0 mL sample of 0.723 M  $\text{HClO}_4$  is titrated with a 0.27 M KOH solution. The  $\text{H}_3\text{O}^+$  concentration after the addition of 80.0 mL of KOH is \_\_\_\_\_ M.

Student Response	Correct Answer
A. 0.44	
B. $3.6 \times 10^{-2}$	
C. 0.72	
D. $1.0 \times 10^{-7}$	
E. $2.8 \times 10^{-13}$	

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**1. chem10b 17.1-1**

The pH of a solution that contains 0.818 M acetic acid ( $K_a = 1.76 \times 10^{-5}$ ) and 0.172 M sodium acetate is \_\_\_\_\_.

Student Response	Correct Answer
A. 8.57	
B. 9.92	
C. 8.37	
D. 5.43	
E. 4.08	

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**2. chem10b 17.1-3**

Consider a solution containing 0.100 M fluoride ions and 0.126 M hydrogen fluoride. The concentration of hydrogen fluoride after addition of 5.00 mL of 0.0100 M HCl to 25.0 mL of this solution is \_\_\_\_\_ M.

Student Response	Correct Answer
A. 0.126	
B. 0.100	

C. 0.00976

D. 0.107

E. 0.00193

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**3. chem10b 17.4-3**

The solubility product of a compound is numerically equal to the product of the concentration of the ions involved in the equilibrium, each multiplied by its coefficient in the equilibrium reaction.

Student Response	Value	Correct Answer

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**4. chem10b 17.2-24**

In which of the following aqueous solutions would you expect AgCl to have the highest solubility?

Student Response	Correct Answer
A. 0.020 KCl	
B. pure water	
C. 0.015 NaCl	
D. 0.020 AgNO <sub>3</sub>	
E. 0.020 M BaCl <sub>2</sub>	

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**5. chem10b 17.2-23**

In which of the following aqueous solutions would you expect AgCl to have the lowest solubility?

Student Response	Correct Answer
A. 0.015 NaCl	
B. 0.020 AgNO <sub>3</sub>	
C. 0.020 KCl	
D. 0.020 M BaCl <sub>2</sub>	

E. pure water

**6. chem10b 17.4-1**

The extent of ionization of a weak electrolyte is increased by adding to the solution a strong electrolyte that has an ion in common with the weak electrolyte.

Student Response	Value	Correct Answer

**7. chem10b 17.5-18**

What is the molar solubility of barium fluoride (  $\text{BaF}_2$  ) in water? The solubility-product constant for  $\text{BaF}_2$  is  $1.7 \times 10^{-6}$  at

Student Response	Correct Answer
A. $1.8 \times 10^{-3}$	
B. $1.2 \times 10^{-2}$	
C. $7.5 \times 10^{-3}$	
D. $6.5 \times 10^{-4}$	
E. $5.7 \times 10^{-7}$	

**8. chem10b 17.5-16**

A 25.0-mL sample of 0.150 M hydrazoic acid is titrated with a 0.150 M NaOH solution. What is the pH after 13.3 mL of base is added? The  $K_a$  of hydrazoic acid is  $1.9 \times 10^{-5}$ .

Student Response	Correct Answer
A. 1.34	
B. 4.78	
C. 4.45	
D. 3.03	
E. 4.66	

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**9. chem10b 17.2-25**

In which of the following aqueous solutions would you expect AgBr to have the lowest solubility?

Student Response	Correct Answer
A. 0.10 M AgNO <sub>3</sub>	
B. 0.10 M LiBr	
C. pure water	
D. 0.15 M KBr	
E. 0.20 M NaBr	

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**10. chem10b 17.2-1**

Which one of the following pairs cannot be mixed together to form a buffer solution?

Student Response	Correct Answer
A. H <sub>3</sub> PO <sub>4</sub> , KH <sub>2</sub> PO <sub>4</sub>	
B. NH <sub>3</sub> , NH <sub>4</sub> Cl	
C. RbOH, HBr	
D. NaC <sub>2</sub> H <sub>3</sub> O <sub>2</sub> , HCl (C <sub>2</sub> H <sub>3</sub> O <sub>2</sub> <sup>-</sup> = acetate)	
E. KOH, HF	

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**11. chem10b 17.1-2**

Consider a solution containing 0.100 M fluoride ions and 0.126 M hydrogen fluoride. The concentration of fluoride ions after the addition of 5.00 mL of 0.0100 M HCl to 25.0 mL of this solution is \_\_\_\_\_ M.

Student Response	Correct Answer
A. 0.00167	
B. 0.0817	
C. 0.00253	
D. 0.0980	
E. 0.0850	

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**12. chem10b 17.2-26**

In which of the following aqueous solutions would you expect AgBr to have the highest solubility?

Student Response	Correct Answer
A. 0.15 M KBr	
B. pure water	
C. 0.10 M LiBr	
D. 0.10 M AgNO <sub>3</sub>	
E. 0.20 M NaBr	

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**1. chem10b 17.5-1**

Calculate the pH of a solution that is 0.295 M in sodium formate (NaHCO<sub>2</sub>) and 0.205 M in formic acid HCO<sub>2</sub>H. The K<sub>a</sub> of formic acid is  $1.77 \times 10^{-4}$ .

Student Response	Correct Answer
A. 4.963	
B. 10.10	
C. 13.84	
D. 3.903	
E. 3.587	

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**2. chem10b 17.2-34**

Why does fluoride treatment render teeth more resistant to decay?

Student Response	Correct Answer
A. Fluoride kills the bacteria in the mouth that make the acids that decay teeth.	
B. Fluoride reduces saliva production, keeping teeth drier and thus reducing decay.	



- |  |
|--|
| C. Fluoride stimulates production of tooth enamel to replace that lost to decay.       |
| D. Fluoride converts hydroxyapatite to fluoroapatite that is less reactive with acids. |
| E. Fluoride dissolves plaque, reducing its decaying contact with teeth.                |

**3. chem10b 17.2-9**

Which of the following could be added to a solution of acetic acid to prepare a buffer?

Student Response	Correct Answer
A. hydrochloric acid	
B. more acetic acid	
C. nitric acid	
D. sodium hydroxide	
E. None of the above can be added to an acetic acid solution to prepare a buffer.	

**4. chem10b 17.2-4**

The Henderson-Hasselbalch equation is \_\_\_\_\_.

Student Response	Correct Answer
A. $\text{pH} = \text{pK}_a + \log$	
B. $[\text{H}^+] = K_a + (\text{base/acid})$	
C. $\text{pH} = \text{pK}_a + \log (\text{base/acid})$	
D. $\text{pH} = \log (\text{base/acid})$	
E. $\text{pH} = \text{pK}_a - \log (\text{base/acid})$	

**6. chem10b 17.1-4**

The  $K_a$  of acetic acid is  $1.76 \times 10^{-5}$ . The pH of a buffer prepared by combining 50.0 mL of  $\text{KCH}_3\text{O}_2$  potassium acetate and 50.0 mL of 1.00 M acetic acid is \_\_\_\_\_.

Student Response	Correct Answer
A. 4.77	
B. 1.70	
C. 3.40	
D. 2.38	
E. 0.85	

**7. chem10b 17.5-13**

A 25.0-mL sample of 0.150 M butanoic acid is titrated with a 0.150 M NaOH solution. What is the pH before any base is added? The  $K_a$  of butanoic acid is  $1.5 \times 10^{-5}$ .

Student Response	Correct Answer
A. 2.83	
B. $1.5 \times 10^{-3}$	
C. 4.82	
D. 4.00	
E. $1.0 \times 10^4$	

**8. chem10b 17.4-3**

The solubility product of a compound is numerically equal to the product of the concentration of the ions involved in the equilibrium, each multiplied by its coefficient in the equilibrium reaction.

Student Response	Value	Correct Answer

**10. chem10b 17.5-14**

A 25.0 mL sample of 0.150 M hypochlorous acid is titrated with a 0.150 M NaOH solution. What is the pH after 26.0 mL of base is added? The  $K_a$  of hypochlorous acid is  $3.0 \times 10^{-8}$ .

Student Response	Correct Answer

A. 2.54
B. 7.54
C. 7.00
D. 7.51
E. 11.47

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**11. chem10b 17.1-15**

The pH of a solution prepared by mixing 50.0 mL of 0.125 M KOH and 50.0 mL of 0.125 M HCl is \_\_\_\_\_.

Student Response	Correct Answer
A. 0.00	
B. 7.00	
C. 6.29	
D. 5.78	
E. 8.11	

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**1. chem10b 17.2-32**

Which below best describe(s) the behavior of an amphoteric hydroxide in water?

Student Response	Correct Answer
A. With conc. aq. HCl, its suspension dissolves.	
B. With conc. aq. NaOH, its clear solution forms a precipitate.	
C. With conc. aq. HCl, its clear solution forms a precipitate.	
D. With conc. aq. NaOH, its suspension dissolves.	
E. With <u>both</u> conc. aq. NaOH <u>and</u> conc. aq. HCl, its suspension dissolves.	

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**2. chem10b 17.2-6**

The addition of hydrofluoric acid and \_\_\_\_\_ to water produces a buffer solution.

Student Response	Correct Answer
A. HCl	
B. NaF	
C. NaNO <sub>3</sub>	
D. NaBr	
E. NaCl	

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**3. chem10b 17.1-23**

Calculate the maximum concentration (in M) of silver ions (Ag<sup>+</sup>) in a solution that contains .025M of CO<sub>3</sub><sup>2-</sup>. The K<sub>sp</sub> of Ag<sub>2</sub>CO<sub>3</sub> is 8.1x10<sup>-12</sup>.

Student Response	Correct Answer
A. $1.8 \times 10^{-5}$	
B. $1.4 \times 10^{-6}$	
C. $8.1 \times 10^{-12}$	
D. $3.2 \times 10^{-10}$	
E. $2.8 \times 10^{-6}$	

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**4. chem10b 17.2-28**

In which one of the following solutions is silver chloride the most soluble?

Student Response	Correct Answer
A. 0.0176 M NH <sub>3</sub>	
B. pure water	
C. 0.744 M LiNO <sub>3</sub>	
D. 0.181 M HCl	
E. 0.181 M NaCl	

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**5. chem10b 17.1-9**

Calculate the pH of a solution prepared by dissolving .150 mol of benzoic acid (HBz) and 0.300 mol of sodium benzoate in water sufficient to yield 1 L of solution. The  $K_a$  of benzoic acid is  $6.5 \times 10^{-5}$ .

Student Response	Correct Answer
A. 3.89	
B. 4.49	
C. 4.19	
D. 2.51	
E. 10.1	

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**6. chem10b 17.1-11**

A 25.0 mL sample of 0.723 M  $\text{HClO}_4$  is titrated with a .273 M KOH solution. What is the (molarity) before any base is added?

Student Response	Correct Answer
A. 0.273	
B. 0.439	
C. $2.81 \times 10^{-13}$	
D. $1.00 \times 10^{-7}$	
E. 0.723	

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**7. chem10b 17.5-14**

A 25.0 mL sample of 0.150 M hypochlorous acid is titrated with a 0.150 M NaOH solution. What is the pH after 26.0 mL of base is added? The  $K_a$  of hypochlorous acid is  $3.0 \times 10^{-8}$ .

Student Response	Correct Answer
A. 7.51	
B. 7.54	
C. 7.00	
D. 2.54	

E. 11.47

**8. chem10b 17.2-1**

Which one of the following pairs cannot be mixed together to form a buffer solution?

Student Response	Correct Answer
A. KOH, HF	
B. $\text{H}_3\text{PO}_4$ , $\text{KH}_2\text{PO}_4$	
C. $\text{NH}_3$ , $\text{NH}_4\text{Cl}$	
D. RbOH, HBr	
E. $\text{NaC}_2\text{H}_3\text{O}_2$ , HCl ( $\text{C}_2\text{H}_3\text{O}_2^-$ = acetate)	

**9. chem10b 17.1-17**

A 25.0 mL sample of an HCl solution is titrated with a .139 M NaOH solution. The equivalence point is reached with 15.4 mL of base. The concentration of HCl is \_\_\_\_\_ M.

Student Response	Correct Answer
A. 11.7	
B. 0.0856	
C. 0.00214	
D. 0.139	
E. 0.267	

**10. chem10b 17.5-3**

Calculate the percent ionization of formic acid ( $\text{HCO}_2\text{H}$ ) in a solution that is 0.219 M in formic acid. The  $K_a$  of formic acid is  $1.77 \times 10^{-4}$ .

Student Response	Correct Answer
A. 0.280	
B. 0.0180	
C. 2.87	

D. 12.2

E.  $3.94 \times 10^{-5}$

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**11. chem10b 17.2-35**

The common-ion effect refers to the observation \_\_\_\_\_.

Student Response	Correct Answer
A. that common ions precipitate all counter-ions	
B. ions such as $K^+$ and $Na^+$ are common ions, so that their values in equilibrium constant expressions are always 1.00	
C. that the selective precipitation of a metal ion, such as $Ag^+$ , is promoted by the addition of an appropriate counterion ( $X^-$ ) that produces a compound ( $AgX$ ) with a very low solubility	
D. common ions, such as $Na^+$ (aq), don't affect equilibrium constants	
E. that some ions, such as $Na^+$ (aq), frequently appear in solutions but do not participate in solubility equilibria	

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**12. chem10b 17.2-18**

A solution of HF is titrated with a 0.150 M NaOH solution. Based on the table above, the best indicator for this reaction is \_\_\_\_\_. The  $K_a$  of hydrofluoric acid is  $6.8 \times 10^{-4}$ .

Student Response	Correct Answer
A. thymol blue	
B. bromocresol purple	
C. phenolphthalein	
D. methyl orange	
E. methyl red	