

Quiz: 16.2–16.3 (A)

Name \_\_\_\_\_

**MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.**

- 1) Identify a good buffer.
  - A) significant amounts of both a strong acid and a strong base
  - B) significant amounts of both a weak acid and a strong acid
  - C) small amounts of both a weak acid and its conjugate base
  - D) significant amounts of both a weak acid and its conjugate base
  - E) small amounts of both a strong acid and a strong base
  
- 2) Which of the following is TRUE?
  - A) An effective buffer has very small absolute concentrations of acid and conjugate base.
  - B) A buffer can not be destroyed by adding too much strong base. It can only be destroyed by adding too much strong acid.
  - C) A buffer is most resistant to pH change when [acid] = [conjugate base]
  - D) An effective buffer has a [base]/[acid] ratio in the range of 10 - 100.
  - E) None of the above are true.
  
- 3) Define buffer capacity.
  - A) Buffer capacity is the amount of base that can be added until all of the acid is used up.
  - B) Buffer capacity is the amount of acid that can be added until all of the base is used up.
  - C) Buffer capacity is the amount of base that can be added until all of the base is used up.
  - D) Buffer capacity is the amount of acid that can be added until all of the acid is used up.
  - E) Buffer capacity is the amount of acid or base that can be added to a buffer without destroying its effectiveness.
  
- 4) Calculate the pH of a solution formed by mixing 250.0 mL of 0.15 M  $\text{NH}_4\text{Cl}$  with 100.0 mL of 0.20 M  $\text{NH}_3$ . The  $K_b$  for  $\text{NH}_3$  is  $1.8 \times 10^{-5}$ . (6pts - creating a buffer soln)

5) A 1.00 L buffer solution is 0.250 M in HF and 0.250 M in LiF. Calculate the pH of the solution after the addition of 0.150 moles of solid LiOH. Assume no volume change upon the addition of base. The  $K_a$  for HF is  $3.5 \times 10^{-4}$ . (6 pts - adding an outside component to an existing buffer soln) **ADDING TO BUFFER PROBLEMS WILL NOT BE ON THE EXAM.**

6) Define a buffer. (2pts)

## Answer Key

Testname: QUIZ 16.2-16.3

- 1) D
- 2) C
- 3) E
- 4) 8.98
- 5) 4.06
- 6) Buffers contain significant amounts of both a weak acid and its conjugate base or a weak base and its conjugate acid, enabling the buffer to neutralize added acid or added base.