

Chapter 16 Top

1) Which one of the following statements are TRUE?

- A) A buffer is an aqueous solution composed of two weak acids.
- B) A buffer can absorb an unlimited amount of acid or base.
- C) A buffer resists pH change by reacting with both acids and bases.
- D) A buffer does not change pH when strong acid or base is added.
- E) None of the above are true.

Answer: C

2) Calculate the pH of a buffer that is 0.158 M HClO and 0.099 M NaClO. The K_a for HClO is 2.9×10^{-8} .

- A) 7.54
- B) 6.67
- C) 3.77
- D) 6.46
- E) 7.33

Answer: E

3) If the pK_a of HCHO₂ is 3.74 and the pH of an HCHO₂/NaCHO₂ solution is 3.11, which of the following is TRUE?

- A) [HCHO₂] < [NaCHO₂]
- B) [HCHO₂] = [NaCHO₂]
- C) [HCHO₂] << [NaCHO₂]
- D) [HCHO₂] > [NaCHO₂]
- E) It is not possible to make a buffer of this pH from HCHO₂ and NaCHO₂.

Answer: D

4) You wish to prepare an HC₂H₃O₂ buffer with a pH of 4.24. If the pK_a of is 4.74, what ratio of C₂H₃O₂⁻ /HC₂H₃O₂ must you use?

- A) 0.10
- B) 0.50
- C) 0.32
- D) 2.0
- E) 2.8

Answer: C

5) A 1.00 L buffer solution is 0.150 M in $\text{HC}_7\text{H}_5\text{O}_2$ and 0.250 M in $\text{LiC}_7\text{H}_5\text{O}_2$.

Calculate the pH of the solution after the addition of 100.0 mL of 1.00 M HCl. The K_a for $\text{HC}_7\text{H}_5\text{O}_2$ is 6.5×10^{-5} .

- A) 4.19
- B) 5.03
- C) 4.41
- D) 3.34
- E) 3.97

Answer: E

6) Which of the following acids (listed with $\text{p}K_a$ values) and their conjugate base would be best to form a buffer with a pH of 8.10?

- A) $\text{HC}_7\text{H}_5\text{O}_2$, $\text{p}K_a = 4.19$
- B) HF, $\text{p}K_a = 3.46$
- C) HClO, $\text{p}K_a = 7.54$
- D) HCN, $\text{p}K_a = 9.31$
- E) HClO_2 , $\text{p}K_a = 1.96$

Answer: C