ALBERTA CHEMISTRY 30 · UNIT D · 10 QUESTIONS

Equilibrium, Acids & Bases — Practice Test

This practice test was made by AI and there may be mistakes. If a question or answer looks wrong, use the Flag a mistake button to let Brett know so he can fix it.

1 **Consider the following equilibrium system.**
$CaCO_3(s) \rightleftharpoons CaO(s) + CO_2(g)$
When additional $CaCO_3(s)$ is added to the system at equilibrium, the equilibrium position

- A shifts toward the reactants
- B does not change
- C shifts toward the products
- D shifts, and the value of Kc increases

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2

A buffer solution contains HF(aq) and NaF(aq). When a small amount of HCl(aq) is added to the buffer, the added hydronium ions react primarily with

A $F^-(aq)$

B $HF(aq)$

C $H_2O(l)$

D $Na^+(aq)$

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3 **Acid ionization constants:**

K_a of HF(aq) = 3.5×10^{-4}

K_a of CH_3COOH(aq) = 1.8×10^{-5}

K_a of HCN(aq) = 6.2×10^{-10}

HCl(aq) ionizes completely.

Which of the following species is the strongest base?

A CN^-(aq)

B F^-(aq)

C CH_3COO^-(aq)

D Cl^-(aq)

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4 **The K_a value of NH_4^+(aq) is 5.6×10^{-10}. The pH of a 0.10 mol/L NH_4Cl(aq) solution, to the nearest hundredth, is**

ANSWER _____

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5 **Which of the following 0.10 mol/L solutions has the highest pH?**

- A $NH_4Cl(aq)$
- B $NaCl(aq)$
- C $NaCH_3COO(aq)$
- D $HCl(aq)$

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6 **A solution of nitrous acid, $HNO_2(aq)$, is at equilibrium. When solid $NaNO_2$ is dissolved in the solution, the pH of the solution will**

- A decrease, because the ionization of $HNO_2(aq)$ increases
- B remain the same, because $NaNO_2$ is a neutral salt
- C increase, because the ionization of $HNO_2(aq)$ is suppressed
- D become exactly 7.0

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7 **The graph shows the pH during the titration of hydrochloric acid with sodium hydroxide solution. The volume of base added at the equivalence point, in millilitres, is ____.**

ANSWER _____

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8 **A 0.10 mol/L solution of a weak acid, HX(aq), has a pH of 3.00. The K_a value of HX(aq) is approximately**

A 1.0×10^{-3}

B 1.0×10^{-5}

C 1.0×10^{-6}

D 2.0×10^{-5}

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9 **Hydrofluoric acid, HF(aq), has a K_a value of 3.5×10^{-4}. The pH of a buffer solution that contains 0.30 mol/L HF(aq) and 0.30 mol/L NaF(aq), to the nearest hundredth, is**

ANSWER _____

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10 **The graph shows the pH during the titration of a strong acid with a strong base. The pH at the equivalence point is**

A 5.0

B 7.0

C 9.0

D 11.0

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ANSWER KEY

1.	B	**5.**	C	**9.**	3.46
2.	A	**6.**	C	**10.**	B
3.	A	**7.**	30.0		
4.	5.13	**8.**	B		

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