

HW04 - Acids, Bases, and Salts

⚠ This is a preview of the draft version of the quiz

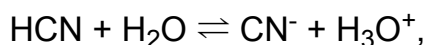
Started: Sep 23 at 8:06pm

Quiz Instructions

Question 1

1 pts

In the reversible reaction



the two Bronsted-Lowry acids are...

- There is only one Bronsted-Lowry acid shown: H_3O^+ .
- HCN and H_3O^+
- H_2O and H_3O^+
- HCN and CN^-
- H_2O and CN^-

Question 2

1 pts

A water solution of sodium acetate is basic because...

- sodium acetate is only weakly ionized.
- The statement is false. A water solution of sodium acetate is acidic.
- the conjugate base of the acetate ion is a strong base.
- the acetate ion acts as a Bronsted-Lowry base in a reaction with water.

Question 3

1 pts

According to the Bronsted-Lowry concept of acids and bases, which of the following statements about a base is NOT true?

- If a base is strong, then its conjugate acid will be relatively weaker.
- A base will share one of its electron pairs to bind H^+ .
- A base reacts with an acid to form a salt.
- A base must contain a hydroxide group.

Question 4

1 pts

Which of the following is true in pure water at any temperature?

- $[H_3O^+][OH^-] = 1.0 \times 10^{-14}$
- $[H_3O^+] = [OH^-]$
- K_w decreases with increasing temperature.
- $pH = 7.0$

Question 5

1 pts

What is $[H_3O^+]$ when $[OH^-] = 3.3 \times 10^{-9} M$?

- $3.0 \times 10^{-6} M$
- $3.3 \times 10^{-9} M$

$3.3 \times 10^{-5} \text{ M}$

$1.0 \times 10^{-7} \text{ M}$

Question 6

1 pts

A strong acid (or base) is one which...

should only be used when wearing goggles and gloves.

reacts with a salt to form water.

dissolves metals.

dissociates completely in aqueous solution.

Question 7

1 pts

Which of the following substances is a strong acid?

H_2SO_4

H_3PO_4

HF

HSO_3

H_2CO_3

Question 8

1 pts

HCN is classified as a weak acid in water. This means that it produces...

no hydronium ions.

a relatively large fraction of the maximum number of possible hydronium ions.

a relatively small fraction of the maximum number of possible hydronium ions.

100% of the maximum number of possible hydronium ions.

Question 9

1 pts

Which of the following substances is a weak acid?

HNO₃

HI

HClO₄

H₂SO₄

HCl

HClO₃

HBr

H₂CO₃

Question 10

1 pts

Which is NOT a conjugate acid-base pair, respectively?

H₂O : OH⁻

SO₄²⁻ : HSO₄⁻

HCN : CN⁻

$\text{H}_3\text{O}^+ : \text{H}_2\text{O}$

Question 11

1 pts

The conjugate base of H_2SO_4 is:

HSO_4^-

HSO_4

SO_4^{2-}

H_3SO_4^+

Question 12

1 pts

What is the conjugate acid of NO_3^- ?

NO_3^{2-}

NH_3

HNO_3

NO_2^-

Question 13

1 pts

Assume that five weak acids, identified only by numbers (1, 2, 3, 4, and 5) have the following ionization constants:

1 - 1.0×10^{-3}

2 - 3.0×10^{-5}

3 - 2.6×10^{-7}

4 - 4.0×10^{-9}

5 - 7.3×10^{-11}

The anion of which acid is the strongest base?

3

4

2

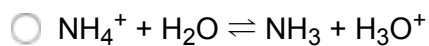
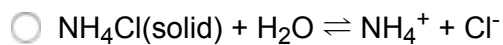
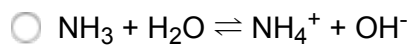
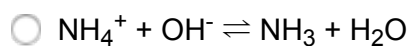
5

1

Question 14

1 pts

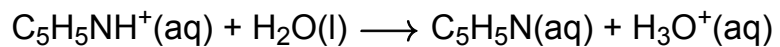
The term " K_a for the ammonium ion" describes the equilibrium constant for which of the following reactions?



Question 15

1 pts

If the value of K_b for pyridine ($\text{C}_5\text{H}_5\text{N}$) is 1.8×10^{-9} , calculate the equilibrium constant for the following reaction:



-1.8×10^{-9}

1.8×10^{-16}

5.6×10^{-6}

5.6×10^8

Question 16

1 pts

What is $[\text{OH}^-]$ in a 0.0050 M HCl solution?

1.0×10^{-7} M

6.6×10^{-5}

2.0×10^{-12} M

1.0 M

Question 17

1 pts

Which pH represents a solution with 1000 times higher $[\text{OH}^-]$ than a solution with a pH of 5?

pH = 4

pH = 6

pH = 8

pH = 7

Question 18

1 pts

What is the pH of a 0.1 M $\text{Ba}(\text{OH})_2$ aqueous solution?

 1.33 13.3 9.98 8.7**Question 19**

1 pts

Hydroxylamine is a weak molecular base with $K_b = 6.6 \times 10^{-9}$. What is the pH of a 0.0500 M solution of hydroxylamine?

 8.93 10.4 9.48 9.26**Question 20**

1 pts

What is the pH of a 0.23 M solution of potassium generate (KR-COO)? K_a for the generic acid R-COOH is 2.7×10^{-8} .

 10.23 10.47

10.83

10.60

Question 21

1 pts

Which solution has the highest pH?

0.1 M KClO, K_a for HClO is 3.5×10^{-8}

0.1 M KCH_3COO , K_a for CH_3COOH is 1.8×10^{-5}

0.1 M of KNO_2 , K_a for HNO_2 is 4.5×10^{-4}

0.1 M of KCl, K_a for HCl is VERY LARGE!!

Question 22

1 pts

What is the pH of a solution that contains 11.7g of NaCl for every 200 mL of solution?

1.0×10^{-7}

9.0

10^{-1}

7.0

Question 23

1 pts

What is the pH of a solution made by mixing 0.050 mol of NaCN with enough water to make a liter of solution? K_a for HCN is 4.9×10^{-10} .

12

11

10^{-3}

3

Question 24

1 pts

Identify the list in which all salts produce a basic aqueous solution.

NH_4Cl , $\text{C}_6\text{H}_4\text{NH}_3\text{NO}_3$, FeI_3

AlCl_3 , $\text{Zn}(\text{NO}_3)_2$, KClO_4

KCH_3COO , NaCN , KF

AgNO_3 , NaCHO_2 , CrI_3

Question 25

1 pts

What is the pH in a solution made by dissolving 0.100 moles of sodium acetate (NaCH_3COO) in enough water to make one liter of solution? K_a for CH_3COOH is 1.80×10^{-5} .

10.25

9.25

8.87

5.74

Question 26

1 pts

A 0.200 M solution of a weak monoprotic acid HA is found to have a pH of 3.00 at room temperature. What is the ionization constant of this acid?

 5.0×10^{-6} 1.0×10^{-3} 2.0×10^{-9} 5.3**Question 27**

1 pts

What is the percent ionization for a weak acid HX that is 0.40 M? $K_a = 4.0 \times 10^{-7}$.

 0.0010% 0.10% 0.0020% 0.20%**Question 28**

1 pts

A 0.28 M solution of a weak acid is 3.5% ionized. What is the pH of the solution?

 1.46 2.01 3.17

0.55

Question 29

2 pts

The pH of 0.010 M aqueous aniline is 8.32. What is the percentage protonated?

0.021%

2.1%

It is impossible to tell without knowing the K_a or the K_b for aniline.

0.0021%

No new data to save. Last checked at 8:08pm

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