

Worksheet - Acids, Bases and Salts

- 1) I am pure water. When heated my pH (increases, decreases), because more of my water molecules dissociate.
- 2) I am a 0.020 M solution of weak acid, HA. If I only dissociate to the extent of 1.50%, what is the value of my K_a ?
- 3) I am a 0.20 M solution of hydrocyanic acid, HCN, with a K_a of 4.93×10^{-10} . What is my pH?
- 4) I am a buffer made from 0.10 M acetic acid and 0.15 M sodium acetate. If the K_a for acetic acid is 1.77×10^{-5} , what is my pH?
- 5) I am a substance who turns blue litmus red, neutralizes bases, and tastes sour. What am I?
- 6) I am a species who turns red litmus blue, neutralizes acids, and tastes bitter. What am I?
- 7) I am a 0.020 M solution of a weak acid, HA, who dissociates to the extent of 3.5%. What is the value of my K_a ?
- 8) I am a Bronsted-Lowry acid. Therefore, I am a _____ donor.
- 9) I am a Bronsted-Lowry base. As a result, I am a proton _____.
- 10) I am a bicarbonate ion, HCO_3^- . Because I can both donate and accept a proton under certain conditions, I am called a(n) _____ species.

True and False

- 11) Water is neither an acid nor a base in the Arrhenius system.
- 12) The molarity of water in pure water and in most aqueous solutions is approximately 55.6 M.
- 13) The reaction of an acid with a base to produce a salt and water is an endothermic reaction.
- 14) The larger the value of K_a , the stronger the acid.
- 15) The stronger an acid, the stronger its conjugate base.
- 16) The strongest acid that can exist in aqueous solutions is perchloric acid.
- 17) The strongest base that can exist in aqueous solutions is the OH^- ion.
- 18) A solution with a pH of 13 would be acidic.
- 19) A solution with a pOH of 12 would be basic.
- 20) The hydrogen ion concentration in a solution with a pH of 5.65 is ten times that of one with a pH of 6.65.

Choose the correct word

- 21) A(n) (Bronsted-Lowry, Lewis, Arrhenius) acid is an electron pair acceptor.
- 22) CH_3COOH , acetic acid, is a (weak, strong) acid.
- 23) $\text{C}_2\text{H}_5\text{OH}$ is a(n) (acid, base, salt, alcohol).
- 24) The greater the degree of dissociation, the (stronger, weaker) the acid.
- 25) Acids, bases, and salts are (electrolytes, nonelectrolytes).
- 26) Neutralization is a (fast, slow) reaction.
- 27) The (Arrhenius, Bronsted-Lowry, Lewis, Usanovich) theory is the most conservative acid-base theory and also the oldest.
- 28) The aquated proton is often called the (hydronium, hydroxide) ion.
- 29) A definition which applies a list of properties is called a(n) (conceptual, operational) definition.
- 30) A definition which gives a reason for a set of properties is called a(n) (conceptual, operational) definition.
- 31) CH_3COOH is a(n) (acid, base, salt).
- 32) NH_4Cl is a(n) (acid, base, salt).
- 33) The stronger the acid, the (weaker, stronger) the conjugate base.
- 34) pH values (can, cannot) go off the 0-14 scale of Sorenson.
- 35) Buffers maintain a(n) (definite, indefinite) pH.
- 36) A pH of 2 is (100, 10, 2) times (more, less) acidic than a pH of 4.

Answers

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| 1) decreases | 15) false | 29) operational |
| 2) 4.5×10^{-6} | 16) false | 30) conceptual |
| 3) 5.00 | 17) true | 31) acid |
| 4) 4.92 | 18) false | 32) salt |
| 5) acid | 19) false | 33) weaker |
| 6) base | 20) true | 34) can |
| 7) 2.5×10^{-5} | 21) Lewis | 35) definite |
| 8) proton | 22) weak | 36) 100, more |
| 9) acceptor | 23) alcohol | |
| 10) amphiprotic | 24) stronger | |
| 11) true | 25) electrolytes | |
| 12) true | 26) fast | |
| 13) false | 27) Arrhenius | |
| 14) true | 28) hydronium | |