

Acid/Base Review

1. List three properties of an acid.
2. List three properties of a base.
3. What is the pH range for an acid?
4. What is the pH range for a base?
5. What are the products of the self-ionization of water?
6. To what degree does water ionize?
7. What is the value for K_w at 25°C ?
8. What is the hydrogen ion concentration of water at 25°C ?
9. If the hydrogen ion concentration is 10^{-8} , what is the nature of the solution?
10. If the hydroxide ion concentration is 10^{-8} , what is the nature of the solution?
11. If the hydrogen ion concentration is 10^{-5} , what is the pH of the solution?
12. If the hydroxide ion concentration is 10^{-12} , what is the pH of the solution?
13. If the hydrogen ion concentration is 8.5×10^{-3} , what is the pH of the solution?
14. If the hydroxide ion concentration is 2.8×10^{-12} , what is the pH of the solution?
15. If the pH is 12.75, what is the concentration of hydrogen ions?
16. If the pH is 11.63, what is the concentration of hydroxide ions?
17. What is the $[\text{H}^+]$ concentration of a 0.20 M HCl solution?
18. What is the $[\text{H}^+]$ concentration of a 0.20 M H_2SO_4 solution? (assume complete dissociation)
19. What is the $[\text{OH}^-]$ concentration of a 3.01×10^{-2} M $\text{Ca}(\text{OH})_2$ solution?
20. What are the products of a neutralization reaction?
21. What is the point in a titration when the amount of OH^- exactly equals the amount of H^+ ?
22. What type of reaction is involved in a titration?
23. How can you tell when the amount of OH^- exactly equals the amount of H^+ in a titration?
24. What is the concentration of 100.0 mL HCl if 25.0 mL of 0.25 M NaOH neutralizes it?
25. How many mL of 0.50 M NaOH are required to neutralize 25 mL of 0.10 M HCl?
26. Name the following acids. HCl, HClO, HClO_2 , HClO_3 , HClO_4 , H_2S , H_2SO_3 , H_2SO_4
27. Name the following bases, NaOH, $\text{Ca}(\text{OH})_2$, $\text{Al}(\text{OH})_3$, NH_3
28. What is the difference between a strong acid and a weak acid?
29. What is the difference between strength of an acid and concentration of an acid?
30. What is a conjugate acid?
31. What is a conjugate base?
32. In the following reaction, identify the acid, base, conjugate acid and conjugate base.
$$\text{HNO}_2 + \text{NaOH} \rightarrow \text{H}_2\text{O} + \text{NaNO}_2$$
33. What is the conjugate base of Acetic Acid, $\text{HC}_2\text{H}_3\text{O}_2$?
34. Find the K_a for a 0.300M solution of a weak acid that has a $[\text{H}^+] = 3.5 \times 10^{-5}$.
35. What is the K_b of a base if the original concentration of the base was 1.0 M and the equilibrium concentration of the hydroxide ions is 1.5×10^{-6} ?