

Solutions Review

- Write the dissolving equation for solid $\text{Ba}(\text{NO}_3)_2$.
 - Explain why water is able to dissolve this ionic compound.
- Write the balanced chemical, ionic, and net ionic equations for the following reactions:
 - $\text{KBr}_{(aq)} + \text{MgCl}_2_{(aq)} \longrightarrow$
 - $\text{Ca}(\text{NO}_3)_2_{(aq)} + \text{CuSO}_4_{(aq)} \longrightarrow$
- Describe how you could distinguish between the following mixtures:
 - $\text{CoCl}_2_{(aq)}$ and $\text{AgNO}_3_{(aq)}$
 - A solution that may contain Ag^+ , Sr^{2+} , and/or Zn^{2+} .
- A 1.0 kg sample of water is 24 ppm Pb. Determine the mass of lead present. (0.024 g)
- What mass of sodium chloride is needed to make 100 mL of 4.0 % solution? (4.0 g)
- What mass of sodium chloride is needed to make 2.50 L of 1.34 mol/L solution? (196 g)
- Calculate the molarity of **each ion** when 2.6 g of Na_2SO_4 is dissolved in 500 mL of H_2O .
 ($[\text{Na}^+] = 0.073 \text{ mol/L}$, $[\text{SO}_4^{2-}] = 0.037 \text{ mol/L}$)
- What volume of 11.6 mol/L HCl is needed to make 250 mL of 0.15 mol/L HCl solution?
 (3.2 mL)
- 10.0 mL of 17.8 mol/L H_2SO_4 is diluted to a volume of 55mL. Find $[\text{H}_2\text{SO}_4]$.
 ($[\text{H}_2\text{SO}_4] = 3.2 \text{ mol/L}$)
- Orange juice contains 0.51 mol/L sugar. If 250 mL of water is added to 1.00 L of orange juice, what will be the concentration of the diluted juice? (0.41 mol/L)
- What is an indicator and give an example.
- Estimate what the pH of a 0.1 mol/L weak acid solution would be.
- Classify each of the following species as a Bronsted acid or base, or both:
 - H_2O
 - OH^-
 - H_3O^+
- What are the names and formulas of the conjugate bases of the following acids?
 - HNO_2
 - H_2SO_4
 - HCN
- Identify the acid-base conjugate pairs in each of the following reactions:
 - $\text{CH}_3\text{COO}^- + \text{HCN} \longrightarrow \text{CH}_3\text{COOH} + \text{CN}^-$
 - $\text{H}_3\text{PO}_4 + \text{NH}_3 \longrightarrow \text{H}_2\text{PO}_4^- + \text{NH}_4^+$
 - $\text{HClO} + \text{CH}_3\text{NH}_2 \longrightarrow \text{CH}_3\text{NH}_3^+ + \text{ClO}^-$

16. Give the conjugate acid of each of the following bases:

- a) HS^- b) HCO_3^- c) CO_3^{2-}

17. Give the conjugate base of each of the following acids:

- a) HIO_4 b) H_3PO_4 c) NH_4^+

18. Define pH. Why do chemists normally choose to discuss the acidity of a solution in terms of pH rather than hydrogen ion concentration, $[\text{H}^+]$?

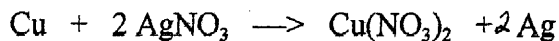
19. Calculate the pH of water at 40 °C, given that the $[\text{H}^+]$ is 3.8×10^{-7} at this temperature.

20. An ammonia cleaner has a pH of 12.6. Determine the $[\text{H}^+]$.

21. During a titration, 15.0 mL of H_3PO_4 required 11.9 mL of 0.38 mol/L $\text{Ca}(\text{OH})_2$. Calculate $[\text{H}_3\text{PO}_4]$ and $[\text{H}^+]$. ($[\text{H}_3\text{PO}_4] = 0.20$ mol/L, $[\text{H}^+] = 0.60$ mol/L)

22. What volume of 0.38 mol/L NaOH would be required to completely neutralize 15.0 mL of 0.20 mol/L H_3PO_4 . (24 mL)

23. Consider the following reaction:



- a) If 15.0 mL of 0.10 mol/L AgNO_3 reacts completely, what mass of Ag can be produced?
(0.32 g Ag)
- b) If 2.5 g of Cu reacts, what mass of Ag can be produced? (8.5 g Ag)