

1. What is the $[\text{Cl}^-]$ in a solution made by dissolving 0.53 mol of FeCl_3 in enough water to make a 233 mL solution?

a. 0.758 M

b. 2.27 M

c. 6.82 M

d. 7.58 M

Hint: Stoichiometry is in effect. How many moles of Chloride are released per mole of FeCl_3

2. What does the molarity of ammonium sulfide need to be to obtain a 0.322 M solution of the ammonium ion?

a. 0.322 M

b. 0.161 M

c. 0.644 M

d. 6.21 M

Hint: Stoichiometry. The formula of ammonium sulfide is $(\text{NH}_4)_2\text{S}$

3. How would you make a 25.0 mL solution that is $[\text{NaCl}] = 0.500 \text{ M}$?

a. Dissolve 29.2 g of NaCl in 25.0 mL of water

b. Dissolve 29.2 g of NaCl in enough water to make a 25 mL solution

c. Dissolve 0.730 g of NaCl in 25.0 mL of water

d. Dissolve 0.730 g of NaCl in enough water to make a 25 mL solution

Hint: Volumes change upon forming solutions. Review the definition of molarity

4. How many mL of a 0.45 M stock solution of NaCl would be required to make a 25.0 mL solution that is $1.33 \times 10^{-2} \text{ M}$ NaCl.

a. 0.74 mL of stock solution

b. 0.15 mL of stock solution

c. 1.2 mL of stock solution

d. 1.7 mL of stock solution

Hint: Dilution is the solution.

5. Two solutions are mixed, a 25.0 mL solution that is 0.750 M NaCl and a 35 mL solution that is 0.500 M $\text{Pb}(\text{NO}_3)_2$. How many grams of $\text{PbCl}_{2(s)}$ will precipitate from solution?

- a. 4.87 g
- b. 2.61 g
- c. 5.21 g
- d. 10.1 g

Hint: This requires a balanced chemical reaction. It is also a limiting reagent problem.

6. How many mL of a 0.333 M NaCl solution are required to completely precipitate silver (I) chloride from a 25.0 mL solution that is 0.500 M AgNO_3 ?

- a. 26.7 mL
- b. 18.8 mL
- c. 37.5 mL
- d. 16.7 mL

Hint: A volume and a molarity together tell us the number of moles of reagent. That, along with the fact that $M = \text{mol/L}$ allow us to convert moles of compound into liters or mL.

7. Two solutions are mixed, a 25.0 mL solution that is 0.750 M NaCl and a 35 mL solution that is 0.500 M $\text{Pb}(\text{NO}_3)_2$. What is the molarity of Pb^{+2} in solution after precipitation?

- a. 8.13×10^{-3} M
- b. 0.328 M
- c. 9.38×10^{-3} M
- d. 0.135 M

Hint: NaCl is the limiting reagent. Requires a balanced chemical reaction. We need to know how many moles of Pb^{+2} are used before we can find out how many are left over.