

CHAPTER 6	Calculating Concentrations of Acids and Bases	BLM 6.3.2
ASSESSMENT		

1. Calculating Concentration from Moles and Volume:

(a) What is the concentration of acid when 0.384 moles of hydrobromic acid, HBr(aq) , are dissolved in 350 mL of water?

(b) What is the concentration of base when 1.23 moles of sodium hydroxide, NaOH(aq) , are dissolved in 2.5 L of water?

2. Calculating Concentration from Mass and Volume:

(a) Calculate the concentration of hydrochloric acid, HCl(aq) if 5.67 g of acid are dissolved in 3.5 L of water.

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- (b) Calculate the concentration of barium hydroxide, $\text{Ba}(\text{OH})_2(\text{aq})$, if 20.5 g are dissolved in 2.00 L of water.

3. Calculating Concentration from Dilutions:

- (a) What is the concentration of perchloric acid, $\text{HClO}_4(\text{aq})$, if 50.0 mL of a 2.00 mol/L solution is used to make 1.50 L of a new solution?
- (b) What is the concentration of lithium hydroxide, $\text{LiOH}(\text{aq})$, if 30.0 mL of a 0.20 mol/L solution is used to create 100 mL of a new solution?

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4. Calculating Ion Concentrations from Known Acid/Base Concentrations:

(a) What is the concentration of hydronium ions, $\text{H}_3\text{O}^+(\text{aq})$, in a 0.35 mol/L solution of hydroiodic acid?

(b) What is the concentration of hydroxide ions, $\text{OH}^-(\text{aq})$, in a 0.380 mol/L solution of strontium hydroxide, $\text{Sr}(\text{OH})_2(\text{aq})$?

(c) What is the concentration of hydroxide ions, $\text{OH}^-(\text{aq})$, in a 0.51 mol/L solution of cesium hydroxide, $\text{CsOH}(\text{aq})$?

5. Calculation Ion Concentrations from Mixed Question Types:

(a) What is the concentration of hydronium ions, $\text{H}_3\text{O}^+(\text{aq})$, in a solution made by dissolving 4.5 g of gaseous hydrochloric acid, $\text{HCl}(\text{g})$, into 3.0 L of water?

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- (b) What is the concentration of hydroxide ions, $\text{OH}^-(\text{aq})$, in a solution made by dissolving 3.6 g of solid lithium hydroxide, $\text{LiOH}(\text{aq})$, in 3.00L of water?
- (c) What is the concentration of hydroxide ions, $\text{OH}^-(\text{aq})$, in a solution made by dissolving 2.93 g of solid barium hydroxide, $\text{Ba}(\text{OH})_2(\text{s})$, in 2.50 L of water?
- (d) A new dilute solution with a volume of 250 mL is made by taking 50.0 mL of a 0.45 mol/L strontium hydroxide, $\text{Sr}(\text{OH})_2(\text{aq})$, solution. What is the concentration of hydroxide ion, $\text{OH}^-(\text{aq})$, in this new solution?