

Outline for Today

Wednesday, Sept. 26

- Chapter 4: Aqueous Reactions and Solution Stoichiometry
 - Molarity and Concentrations of Solutions
 - Precipitation Reactions
 - Acid-Base Reactions

Table 4.1 Solubility Guidelines for Common Ionic Compounds in Water

Soluble Ionic Compounds		Important Exceptions
Compounds containing	NO_3^-	None
	CH_3COO^-	None
	Cl^-	Compounds of Ag^+ , Hg_2^{2+} , and Pb^{2+}
	Br^-	Compounds of Ag^+ , Hg_2^{2+} , and Pb^{2+}
	I^-	Compounds of Ag^+ , Hg_2^{2+} , and Pb^{2+}
	SO_4^{2-}	Compounds of Sr^{2+} , Ba^{2+} , Hg_2^{2+} , and Pb^{2+}
Insoluble Ionic Compounds		Important Exceptions
Compounds containing	S^{2-}	Compounds of NH_4^+ , the alkali metal cations, Ca^{2+} , Sr^{2+} , and Ba^{2+}
	CO_3^{2-}	Compounds of NH_4^+ and the alkali metal cations
	PO_4^{3-}	Compounds of NH_4^+ and the alkali metal cations
	OH^-	Compounds of NH_4^+ , the alkali metal cations, Ca^{2+} , Sr^{2+} , and Ba^{2+}

Solubility Rules

- Compounds containing the following are **soluble**:

Cation	Exception
Alkali Metals (Group 1A)	None
NH_4^+	None

From Table 4.1

Anion	Exceptions
NO_3^-	None
CH_3COO^-	None
Cl^-	With Ag^{2+} , Hg_2^{2+} , Pb^{2+}
Br^-	With Ag^{2+} , Hg_2^{2+} , Pb^{2+}
I^-	With Ag^{2+} , Hg_2^{2+} , Pb^{2+}
SO_4^{2-}	With Sr^{2+} , Ba^{2+} , Hg_2^{2+} , Pb^{2+}

Solubility Rules

- Compounds containing the following are **NOT soluble**:

Anion	Exceptions
S^{2-}	With NH_4^+ , alkali cations, Ca^{2+} , Sr^{2+} , Ba^{2+}
OH^-	With NH_4^+ , alkali cations, Ca^{2+} , Sr^{2+} , Ba^{2+}
CO_3^{2-}	With NH_4^+ , alkali cations
PO_4^{3-}	With NH_4^+ , alkali cations

From Table 4.1

Memorize Table 4.2

Table 4.2 Common Strong Acids and Bases

Strong Acids

Hydrochloric acid, HCl

Hydrobromic acid, HBr

Hydroiodic acid, HI

Chloric acid, HClO₃

Perchloric acid, HClO₄

Nitric acid, HNO₃

Sulfuric acid (first proton), H₂SO₄

Strong Bases

Group 1A metal hydroxides

[LiOH, NaOH, KOH, RbOH, CsOH]

Heavy group 2A metal hydroxides

[Ca(OH)₂, Sr(OH)₂, Ba(OH)₂]