Name: _____ Section: _____

Solubility Rules

A compound is *soluble* in a particular liquid if it dissolves in that liquid. A compound is *insoluble* if it does NOT dissolve in the liquid. There is no easy way to tell whether a particular compound will be soluble or insoluble in water. For ionic compounds, however, there are empirical rules that have been deduced from observations of many compounds. Consider the following:

Compounds Containing the Following Ions Are Mostly Soluble*	**Exceptions**
Li^+, Na^+, K^+, NH_4^+	None
NO_3^-, $C_2H_3O_2^-$	None
Cl^-, Br^-, I^-	When any of these ions pairs With Ag^+, Hg_2^{+2}, Pb^{+2}, or Cu^+, it is *insoluble*
SO_4^{-2}	When SO_4^{-2} pairs with Sr^{+2}, Ba^{+2}, Pb^{+2}, or Ca^{+2}, it is *insoluble*
Compounds Containing the Following Ions Are Mostly Insoluble*	**Exceptions**
OH^-, S^{-2}	When either of these ions pairs with Li^+, Na^+, K^+, or NH_4^+, it is *soluble*
S^{-2}	When S^{-2} pairs with Sr^{+2}, Ba^{+2}, or Ca^{+2}, the compound is *soluble*
OH^-	When OH^- pairs with Sr^{+2}, Ba^{+2}, or Ca^{+2}, it is *slightly soluble***
CO_3^{-2}, PO_4^{-3}	When either of these ions pairs with Li^+, Na^+, K^+, or NH_4^+, it is *soluble*

*adapted from Tro, Nivaldo J. Introductory Chemistry, 2nd ed. Upper Saddle River: Prentice Hall, 2006.

** For our purposes, these can be considered *insoluble*