Solubility Rules for Ionic Compounds

The following table will be given on the exam **without** the formulas in parentheses.

Compounds Containing the Following Ions Are Mostly Soluble	**Exceptions**
Li^+, Na^+, K^+, NH_4^+	None
nitrate (NO_3^-), acetate ($C_2H_3O_2^-$)	None
chloride (Cl^-), bromide (Br^-), iodide (I^-)	When any of these ions pairs with Ag^+, Hg_2^{2+}, or Pb^{2+}, the compound is insoluble
sulfate (SO_4^{2-})	When sulfate pairs with Sr^{2+}, Ba^{2+}, Pb^{2+}, or Ca^{2+} the compound is insoluble
Compounds Containing the Following Ions Are Mostly Insoluble	**Exceptions**
hydroxide (OH^-), sulfide (S^{2-})	When either of these ions pairs with Li^+, Na^+, K^+, or NH_4^+, the compound is soluble When sulfide (S^{2-}) pairs with Ca^{2+}, Sr^{2+}, or Ba^{2+}, the compound is soluble When hydroxide (OH^-) pairs with Ca^{2+}, Sr^{2+}, or Ba^{2+}, the compound is slightly soluble (for many purposes, these may be considered insoluble)
carbonate (CO_3^{2-}), phosphate (PO_4^{3-})	When either of these ions pairs with Li^+, Na^+, K^+, or NH_4^+, the compound is soluble

Solubility Rules for Ionic Compounds

The following table will be given on the exam exactly as shown here.

Compounds Containing the Following Ions Are Mostly Soluble	**Exceptions**
Li^+, Na^+, K^+, NH_4^+	None
nitrate, acetate	None
chloride, bromide, iodide	When any of these ions pairs with Ag^+, Hg_2^{2+}, or Pb^{2+}, the compound is insoluble
sulfate	When sulfate pairs with Sr^{2+}, Ba^{2+}, Pb^{2+}, or Ca^{2+} the compound is insoluble
Compounds Containing the Following Ions Are Mostly Insoluble	**Exceptions**
hydroxide, sulfide	When either of these ions pairs with Li^+, Na^+, K^+, or NH_4^+, the compound is soluble When sulfide pairs with Ca^{2+}, Sr^{2+}, or Ba^{2+}, the compound is soluble When hydroxide pairs with Ca^{2+}, Sr^{2+}, or Ba^{2+}, the compound is slightly soluble (for many purposes, these may be considered insoluble)
carbonate, phosphate	When either of these ions pairs with Li^+, Na^+, K^+, or NH_4^+, the compound is soluble