Name_____

Solubility Rules for Some Ionic Compounds in Water

Soluble Ionic Compounds use state symbol (aq)	***Except Those Containing: use state symbol (s)***
1. All lithium (Li^+), sodium (Na^+), potassium (K^+), rubidium (Rb^+), cesium (Cs^+) and ammonium (NH_4^+) salts are SOLUBLE.	No common ones
2. All nitrate (NO_3^-), acetate ($C_2H_3O_2^-$), chlorate (ClO_3^-), and perchlorate (ClO_4^-) salts are SOLUBLE	No common ones
3. All chloride (Cl^-), bromide (Br^-), and iodide (I^-) salts are SOLUBLE.	Pb^{+2}, Ag^+, & Hg_2^{+2} are NOT soluble. Mercury(II) iodide (HgI_2) is also NOT soluble.
4. All fluoride (F^-) salts are SOLUBLE.	Mg^{+2}, Ca^{+2}, Sr^{+2}, Ba^{+2}, & Pb^{+2} are NOT soluble.
5. All sulfate (SO_4^{-2}) salts are SOLUBLE.	Ca^{+2}, Sr^{+2}, Ba^{+2}, Pb^{+2}, Ag^+, Hg_2^{+2}, are NOT soluble.
Not Soluble Ionic Compounds use state symbol(s)	***Except Those Containing: use state symbol (aq)***
6. Hydroxide (OH^-) and oxide (O^{-2}) compounds are NOT SOLUBLE	Li^+, Na^+, K^+, Rb^+, Cs^+, NH_4^+, & Ba^{+2}, are soluble. (Ca^{2+} and Sr^{2+} are moderately soluble)
7. Sulfide (S^{-2}) salts are NOT SOLUBLE	Li^+, Na^+, K^+, Rb^+, Cs^+, NH_4^+, & Ba^{+2} are soluble.
8. Carbonate (CO_3^{-2}), phosphate (PO_4^{-3}), chromate (CrO_4^{-2}), oxalate ($C_2O_4^{-2}$) & sulfite (SO_3^{2-}) salts are NOT SOLUBLE	Li^+, Na^+, K^+, Rb^+, Cs^+, & NH_4^+ are soluble.

Soluble compounds are defined as those that dissolve to the extent of 1 g or more per 100 g water.
NOT Soluble compounds are further classified as:
- Slightly soluble, which dissolve to the extent of 0.01 g to 1 g per 100 g water.
- Insoluble, for which less than 0.01 g per 100 g water will dissolve.

SOLUTIONS MADE FROM THE ABOVE SPECIES, WHEN SOLUBLE, ARE FOUND TO EXIST AS CHARGED PARTICLES AND THUS CONDUCT ELECTRIC CURRENT. THEY ARE CONSIDERED ELECTROLYTES. WRITE THEM IN IONIZED FORM IN AQUEOUS SOLUTIONS.

SUMMARY OF STRONG AND WEAK ELECTROLYTES	
RULE	**EXCEPTIONS**
1. Most acids are weak electrolytes	Common strong acids (strong electrolytes) are HCl, HBr, HI, HNO_3, H_2SO_4, $HClO_3$, and $HClO_4$
2. Most bases are weak electrolytes	Strong base hydroxides (strong electrolytes) are those of Li, Na, K, Rb, Ca, Sr, and Ba.
3. Most soluble salts are strong electrolytes.	Important weakly ionized salts are $HgCl_2$, $Hg(CN)_2$, $CdCl_2$, $CdBr_2$, CdI_2, and $Pb(C_2H_3O_2)_2$.