

Solubility Rules Worksheet

Reference the solubility rules for both parts

SOLUBILITY RULES

Soluble:

- All Nitrates, Acetates, Ammonium, and Group 1 (IA) salts
- All Chlorides, Bromides, and Iodides, except Silver, Lead, and Mercury(I)
- All Fluorides except Group 2 (IIA), Lead(II), and Iron(III)
- All Sulfates except Calcium, Strontium, Barium, Mercury, Lead(II), and Silver

Insoluble (0.10 M or greater):

- All Carbonates and Phosphates except Group 1 (IA) and Ammonium
- All Hydroxides except Group 1 (IA), Strontium, Barium, and Ammonium
- All Sulfides except Group 1 (IA), 2 (IIA), and Ammonium
- All Oxides except Group 1 (IA)

1. Classify each of the substances as being soluble or insoluble.

- If Soluble, write **soluble = (aq) state of matter**
- If insoluble, write **insoluble = (s) state of matter**

- a. KBr =
- b. PbCO_3 =
- c. zinc hydroxide =
- d. sodium acetate =
- e. silver iodide =
- f. zinc carbonate =

- g. silver acetate =
- h. copper (II) sulfide =
- i. $\text{Mg}_3(\text{PO}_4)_2$ =
- j. KOH =
- k. NH_4OH =
- l. Hg_2SO_4 =
- m. PbI_2 =

Identify the two new compounds which would be produced if each of the following soluble compounds were mixed. Identify each product with their correct state of matter.

- If a product is **soluble**, its state of matter should be **(aq)**.
- If a product is **insoluble**, its state of matter should be **(s)**

	$\text{KBr}_{(\text{aq})}$	$\text{Na}_2\text{CO}_3_{(\text{aq})}$	$\text{CaS}_{(\text{aq})}$	$\text{NH}_4\text{OH}_{(\text{aq})}$
$\text{AgNO}_3_{(\text{aq})}$				
$\text{BaCl}_2_{(\text{aq})}$				
$\text{Al}(\text{NO}_3)_3_{(\text{aq})}$				
$\text{Cu}(\text{SO}_4)_{(\text{aq})}$				

Helpful information on charges of ions and polyatomics

+1																		0	
H ⁺	+2																	He ⁰	
Li ⁺	Be ²⁺																	Ne ⁰	
Na ⁺	Mg ²⁺																	Ar ⁰	
K ⁺	Ca ²⁺																	Kr ⁰	
Rb ⁺	Sr ²⁺																	Xe ⁰	
Cs ⁺	Ba ²⁺																	Rn ⁰	
Fr ⁺	Ra ²⁺																		

Polyatomic Ions	
NH ₄ ⁺	Ammonium
BrO ₃ ⁻	Bromate
CN ⁻	Cyanide
C ₂ H ₃ O ₂ ⁻ (CH ₃ COO ⁻)	Acetate
ClO ₄ ⁻	Perchlorate
ClO ₃ ⁻	Chlorate
ClO ₂ ⁻	Chlorite
ClO ⁻	Hypochlorite
IO ₃ ⁻	Iodate
MnO ₄ ⁻	Permanganate
NO ₃ ⁻	Nitrate
NO ₂ ⁻	Nitrite
OH ⁻	Hydroxide
HCO ₃ ⁻	Hydrogen carbonate
HSO ₄ ⁻	Hydrogen sulfate
SCN ⁻	Thiocyanate
CO ₃ ²⁻	Carbonate
Cr ₂ O ₇ ²⁻	Dichromate
CrO ₄ ²⁻	Chromate
SO ₄ ²⁻	Sulfate
SO ₃ ²⁻	Sulfite
PO ₄ ³⁻	Phosphate