

## AP Chem: The Must Know List

### Solubility Rules

- 1) -nitrate and -acetate = (aq)
- 2) Group 1 (H<sup>+</sup>, Li<sup>+</sup>, Na<sup>+</sup>, K<sup>+</sup>, Rb<sup>+</sup>, Cs<sup>+</sup>, Fr<sup>+</sup>) and NH<sub>4</sub><sup>+</sup> = (aq)
- 3) -chloride, -bromide, and -iodide = (aq) EXCEPT when with Pb, Hg<sub>2</sub>, or Ag = (s)
- 4) -sulfate = (aq) EXCEPT when with Ba, Ca, Pb, or Hg<sub>2</sub> = (s)
- 5) -hydroxide = (s) EXCEPT when with Group 1 or NH<sub>4</sub><sup>+</sup> = (aq)  
When with Group 2 (Be, Mg, Ca, Sr, Ba, Ra) = (ss)
- 6) -sulfide, -carbonate, and -phosphate = (s) EXCEPT when with Group 1 or NH<sub>4</sub><sup>+</sup> = (aq)

### The Strong Acids

- 1) HCl - hydrochloric acid
- 2) HNO<sub>3</sub> - nitric acid
- 3) H<sub>2</sub>SO<sub>4</sub> - sulfuric acid
- 4) HClO<sub>4</sub> - perchloric acid
- 5) HBr - hydrobromic acid
- 6) HI - hydriodic acid

### The Sig Fig Rules

- 1) 15.61 x 2.2 = 34 (only 2 sig figs because 2.2 only has two sig figs)
- 2) 15.61 + 2.2 = 17.8 (you can be as accurate as your least accurate number, in this case you can be accurate to the 10ths place)

### The Polyatomic Ions

- |                  |                                                           |
|------------------|-----------------------------------------------------------|
| 1. acetate       | C <sub>2</sub> H <sub>3</sub> O <sub>2</sub> <sup>-</sup> |
| 2. ammonium      | NH <sub>4</sub> <sup>+</sup>                              |
| 3. carbonate     | CO <sub>3</sub> <sup>-2</sup>                             |
| 4. chlorate      | ClO <sub>3</sub> <sup>-</sup>                             |
| 5. chromate      | CrO <sub>4</sub> <sup>-2</sup>                            |
| 6. cyanide       | CN <sup>-</sup>                                           |
| 7. dichromate    | Cr <sub>2</sub> O <sub>7</sub> <sup>-2</sup>              |
| 8. hydroxide     | OH <sup>-</sup>                                           |
| 9. nitrate       | NO <sub>3</sub> <sup>-</sup>                              |
| 10. permanganate | MnO <sub>4</sub> <sup>-</sup>                             |
| 11. peroxide     | O <sub>2</sub> <sup>-2</sup>                              |
| 12. phosphate    | PO <sub>4</sub> <sup>-3</sup>                             |
| 13. sulfate      | SO <sub>4</sub> <sup>-2</sup>                             |

A. What is the solubility rule for :

- 1) Ammonium compounds? \_\_\_\_\_
- 2) The phosphates? \_\_\_\_\_
- 3) Any Group I compound? \_\_\_\_\_
- 4) The nitrates? \_\_\_\_\_
- 5) The sulfates? \_\_\_\_\_
- 6) The acetates? \_\_\_\_\_
- 7) The chlorides? \_\_\_\_\_
- 8) The carbonates? \_\_\_\_\_
- 9) The bromides? \_\_\_\_\_
- 10) The hydroxides? \_\_\_\_\_
- 11) The sulfides? \_\_\_\_\_
- 12) The iodides? \_\_\_\_\_

B. Are each of these soluble in water (aq) or precipitates in water (s)?

- \_\_\_\_\_  $\text{MgSO}_4$
- \_\_\_\_\_  $\text{Rb}_3\text{PO}_4$
- \_\_\_\_\_  $\text{Al}(\text{C}_2\text{H}_3\text{O}_2)_3$
- \_\_\_\_\_  $\text{AgBr}$
- \_\_\_\_\_  $\text{BaCO}_3$
- \_\_\_\_\_  $\text{Sr}(\text{OH})_2$
- \_\_\_\_\_  $(\text{NH}_4)_2\text{S}$
- \_\_\_\_\_  $\text{Pb}(\text{NO}_3)_4$
- \_\_\_\_\_  $\text{Pb}(\text{CO}_3)_2$
- \_\_\_\_\_  $\text{Hg}_2\text{SO}_4$
- \_\_\_\_\_  $\text{Pb}(\text{NO}_3)_4$
- \_\_\_\_\_  $\text{BaI}_2$

Make up your own to practice these if you're shaky on them... study well!