

9/30/15

Sections 4.4-4.6

next week in lab: Meet here : Oct 6th

- 1) "Precipitation in Puddles"
- 2) Learning to measure volumes

See Lab website:

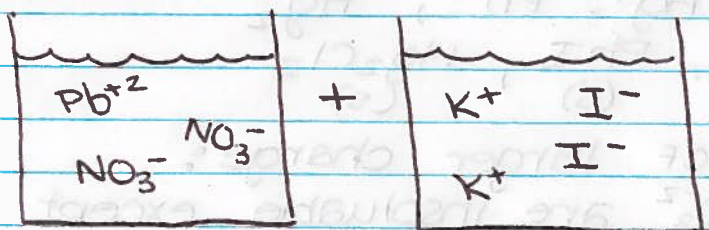
→ One download (experiment)

→ four YouTube videos

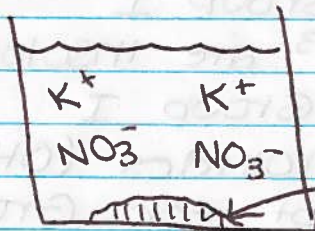
* Learn Solubility Rules *

(aq) = soluble

Precipitate Rxn



Note: All ionics that dissolve (aq) dissociate 100% into ions in H₂O.



Demonstration

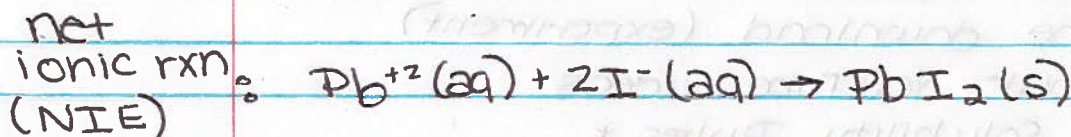
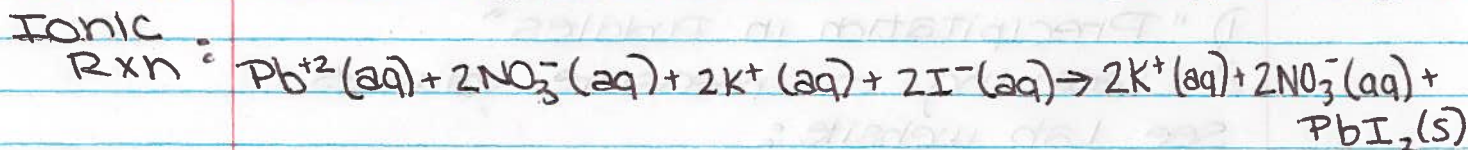
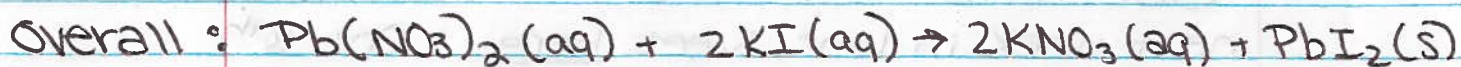
~~formed~~ yellow precipitate (film)
↓
 $\text{PbI}_2 (\text{s})$

ALWAYS
trump
other
rules

Solubility Rules

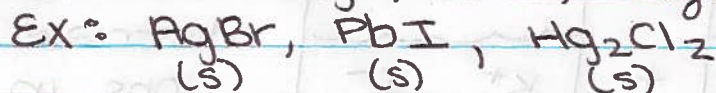
- * All Group 1 cmpds are soluble
Ex: LiBr, NaC₂H₃O₂, KClO₄, RbNO₃
- * All nitrate (NO₃⁻) salts are soluble
- * All ClO₄⁻ are soluble
- * All C₂H₃O₂⁻ are soluble
- * All NH₄⁺ salts are soluble

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"Trouble-Maker" Solubility Rules

- * All Cl^{-} , Br^{-} and I^{-} are soluble, except with Ag^{+} , Pb^{+2} , Hg_2^{+2}



- * Anions of larger charge:

- All CO_3^{-2} are insoluble, except for Group I

- All S_2^{-2} are insoluble, except for Group I

- All PO_4^{-3} are insoluble, except for Group I

- All hydroxides (OH^{-}) are insoluble except for Group I

- All sulfates (SO_4^{-2}) are soluble except for $\text{BaSO}_4(\text{s})$, $\text{PbSO}_4(\text{s})$, and $\text{Hg}_2\text{SO}_4(\text{s})$

ACIDS

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6 strong ACIDS:

	ACID	Anions
1)	HCl - hydrochloric acid	Cl ⁻
2)	HBr - hydrobromic acid	Br ⁻
3)	HI - hydroiodic acid	I ⁻
4)	HNO ₃ - nitric acid	NO ₃ ⁻
5)	HClO ₄ - perchloric acid	perchlorate
6)	H ₂ SO ₄ - sulfuric acid	HSO ₄ ⁻ ClO ₄ ⁻

* All strong acids dissociate 100% in H₂O
Ex: $\text{HCl (aq)} + \text{H}_2\text{O (l)} \xrightarrow{100\%} \text{H}_3\text{O}^+ \text{(aq)} + \text{Cl}^- \text{(aq)}$

* strong acids that dissociate make Strong electrolytes *

template for all strong acids

* All other acids are weak (dissociate < 100%)
Ex: $\text{HC}_2\text{H}_3\text{O}_2 \text{(aq)} + \text{H}_2\text{O (l)} \rightleftharpoons \text{H}_3\text{O}^+ \text{(aq)} + \text{C}_2\text{H}_3\text{O}_2^- \text{(aq)}$
acetic acid acetate

template for all weak acids

Demonstration

- strong acid = lit lightbulb
- ~~so~~ vinegar (weak acid) = barely lit