

N34 - SOLUTIONS

**Net Ionic Equations and
Particle Diagrams**

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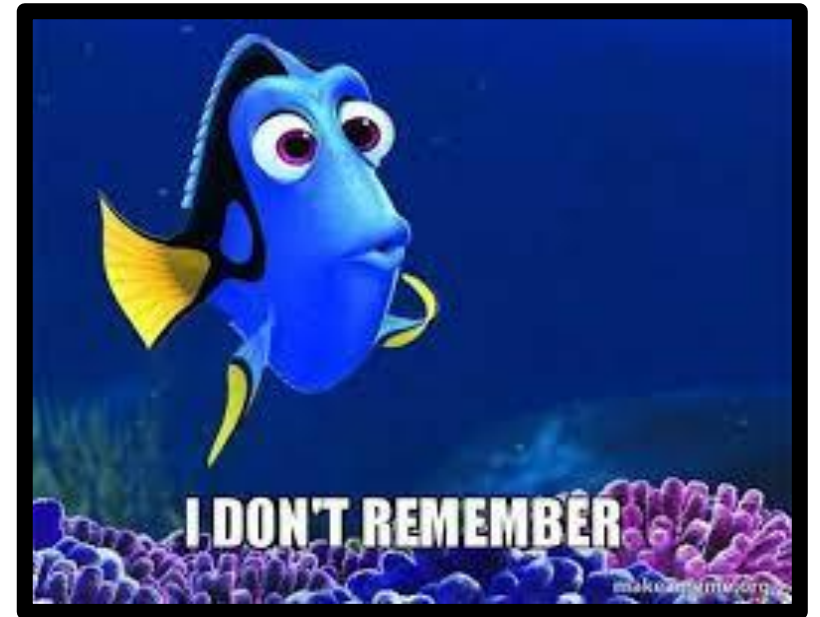
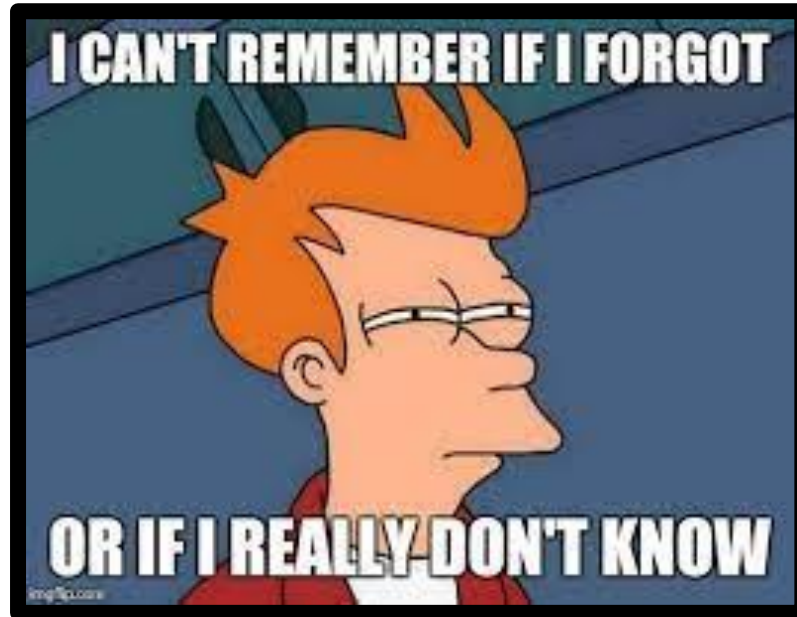
Target: I can write and draw diagrams to represent chemical reactions in a way that focuses attention on just the particles participating.

REVIEW!

This is **OLD** info!

This is one of those topics that people don't practice enough in Honors Chem, and they don't remember.

WE HAVE TO REMEMBER IT!!!!



Solubility Chart

Soluble means it dissolves in water.

The right hand column are some acronyms to help you remember the rules. We don't memorize, but might speed up your homework!

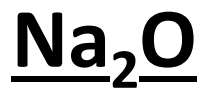
You have a copy in your binder!

Solubility of Some Ionic Compounds in Water		
<u>Always Soluble</u>		
Alkali metals =	Li ⁺ , Na ⁺ , K ⁺ , Rb ⁺ , Cs ⁺	AAA CNP
Ammonium =	NH ₄ ⁺	
Acetate =	C ₂ H ₃ O ₂ ⁻	
Chlorate =	ClO ₃ ⁻	
Nitrate =	NO ₃ ⁻	
Perchlorate =	ClO ₄ ⁻	
<u>Generally Soluble</u>		
Cl ⁻ , Br ⁻ , I ⁻	Soluble <u>except</u> : Ag ⁺ , Pb ²⁺ , Hg ₂ ²⁺	AP-H
F ⁻	Soluble <u>except</u> : Ca ²⁺ , Ba ²⁺ , Sr ²⁺ , Pb ²⁺ , Mg ²⁺	CBS-PM
Sulfate = SO ₄ ²⁻	Soluble <u>except</u> : Ca ²⁺ , Ba ²⁺ , Sr ²⁺ , Pb ²⁺	CBS-P
<u>Generally Insoluble</u>		
O ²⁻ , OH ⁻	Insoluble <u>except</u> : Alkali metals and NH ₄ ⁺	AA
	<u>Somewhat</u> soluble: Ca ²⁺ , Ba ²⁺ , Sr ²⁺	CBS
CO ₃ ²⁻ S ²⁻ , SO ₃ ²⁻ PO ₄ ³⁻ CrO ₄ ²⁻ , Cr ₂ O ₄ ²⁻	Insoluble <u>except</u> : Alkali metals and NH ₄ ⁺	AA

Not Soluble = forms precipitate

Soluble = dissolves in water (aqueous)

Solubility Chart



SOLUBLE b/c it has Na⁺ in it!



INSOLUBLE b/c OH⁻ insoluble and Mg²⁺ not one of the exceptions

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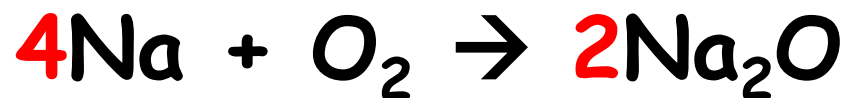
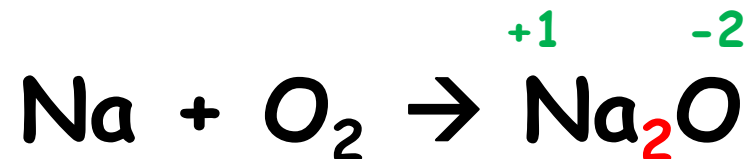
Prediction Products Practice #1

Sodium plus Oxygen yields ???



What type of reaction
does this look like?

Synthesis



Ionic so cross over!
Don't steal
subscripts!

Fix numbers
with balancing

Prediction Products Practice #2

Sodium chloride breaks into its components



What type of reaction
does this look like?

Decomposition



NO!!!

Diatomic

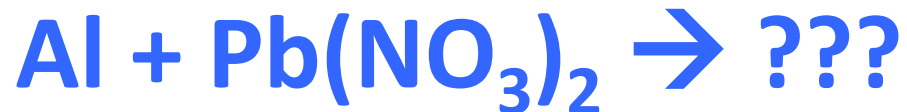


Balance



Prediction Products Practice #3

Aluminum is added Lead(II) Nitrate



Is Al above Pb on Activity Series?

Yes! So rxn will happen!

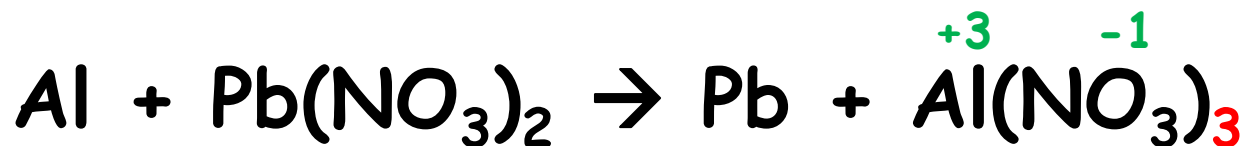
Does Al make cation or anion?

Cation



NO!!!

Ionic so cross over!



Balance



NOT DONE!!!! NEED TO THINK ABOUT PHASES!

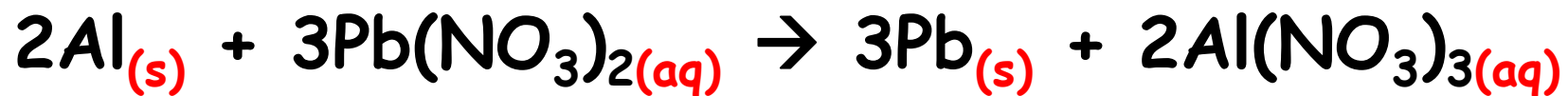
What type of rxn does this look like?
Single Replacement

Prediction Products Practice #3

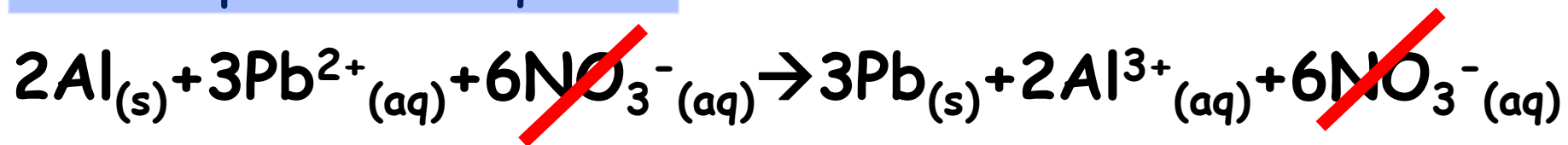
The Balanced Equation



The Overall Equation

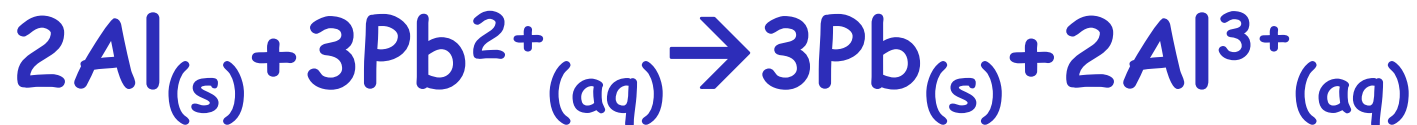


The Complete Ionic Equation



Spectator
Ions

The Net Ionic Equation



**NOT DONE!!!!
NEED TO THINK
ABOUT PHASES!**

Prediction Products Practice #4

What type of rxn
does this look like?



Double Replacement



Ionic so cross over!



Balance



**NOT DONE!!!! NEED TO
THINK ABOUT PHASES!**

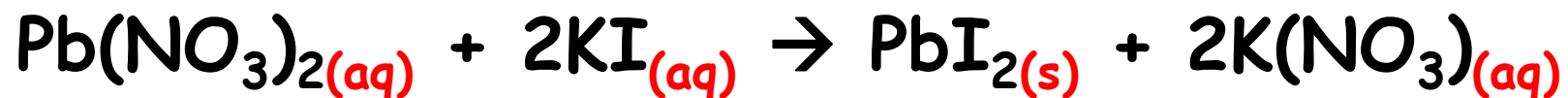
Prediction Products Practice #4

NOT DONE!!!!
NEED TO THINK
ABOUT PHASES!

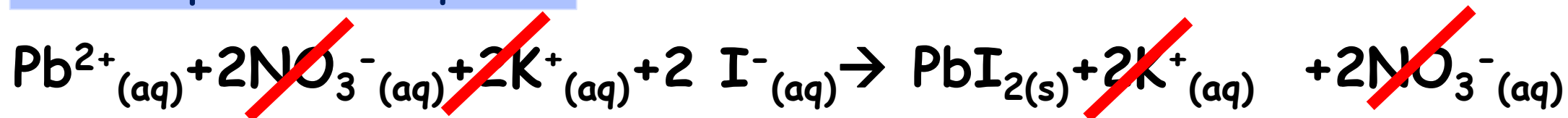
The Balanced Equation



The Overall Equation



The Complete Ionic Equation



The Net Ionic Equation



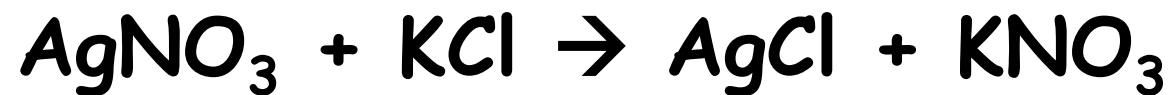
Spectator
Ions

Prediction Products Practice #5

A solution of Silver
Nitrate with a solution
of potassium chloride

What type of rxn
does this look like?

Double Replacement



Already
neutral!



Already
Balanced!

**NOT DONE!!!! NEED TO
THINK ABOUT PHASES!**

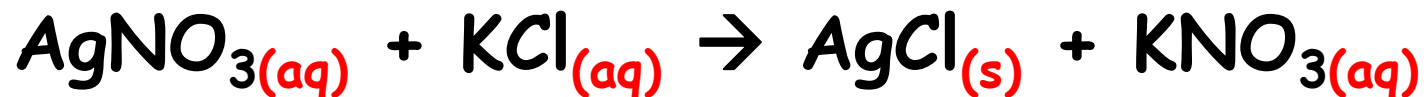
Prediction Products Practice #5

NOT DONE!!!
NEED TO THINK
ABOUT PHASES!

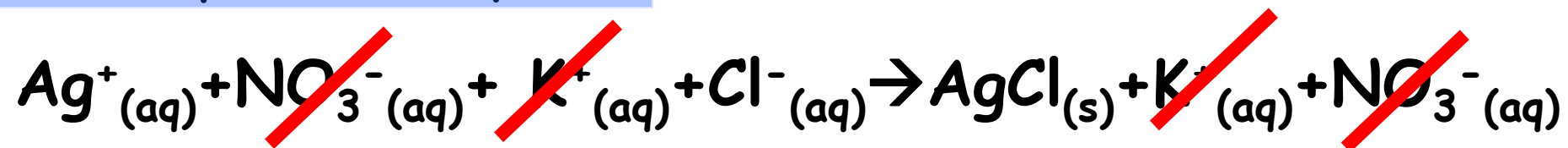
The Balanced Equation



The Overall Equation



The Complete Ionic Equation



Spectator
Ions

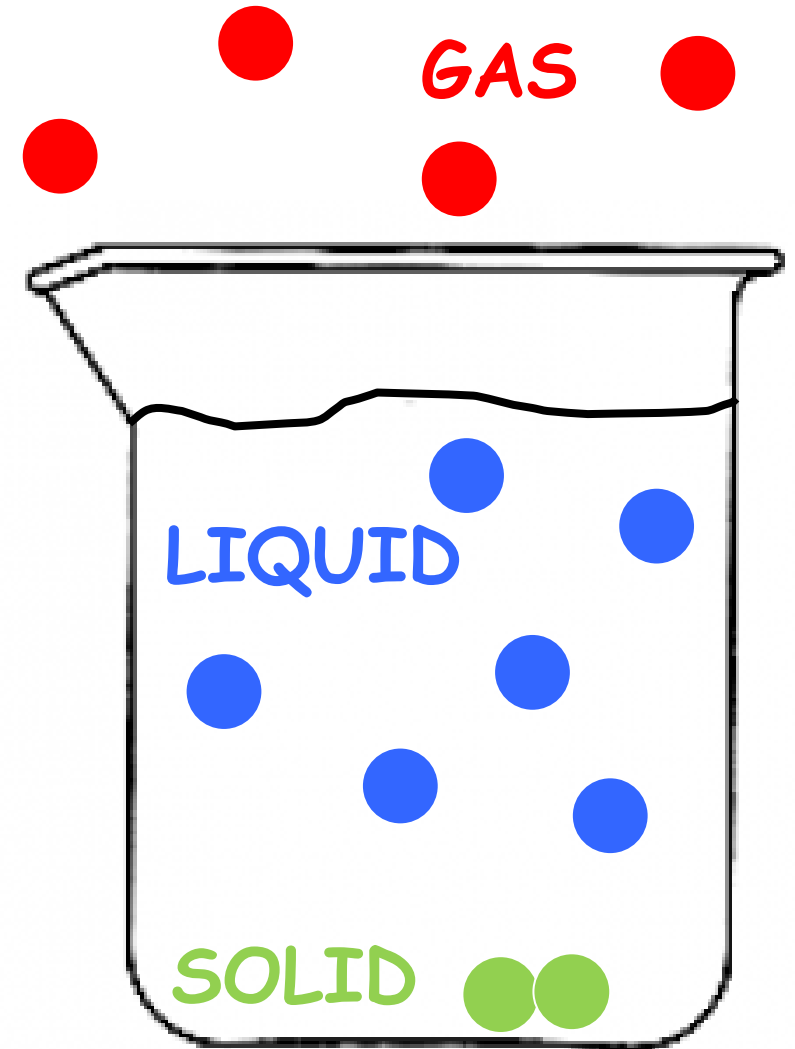
The Net Ionic Equation



Particulate Diagrams

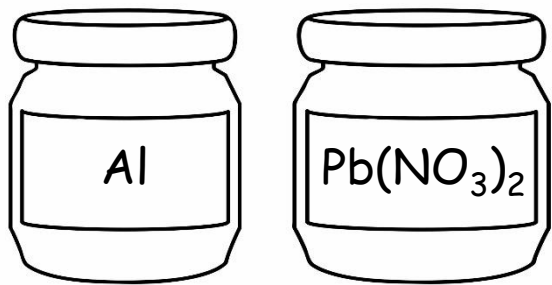
“Particulate representations of solutions communicate the structure and properties of solutions, by illustration of the relative concentrations of the components in the solution and drawings that show interactions among the components.”

- Use little color coded (or labeled) circles to represent particles
- A “particle” can be an atom, an ion, a polyatomic ion, compound or molecule.
- Use the right number of circles! Draw them to represent phases too!



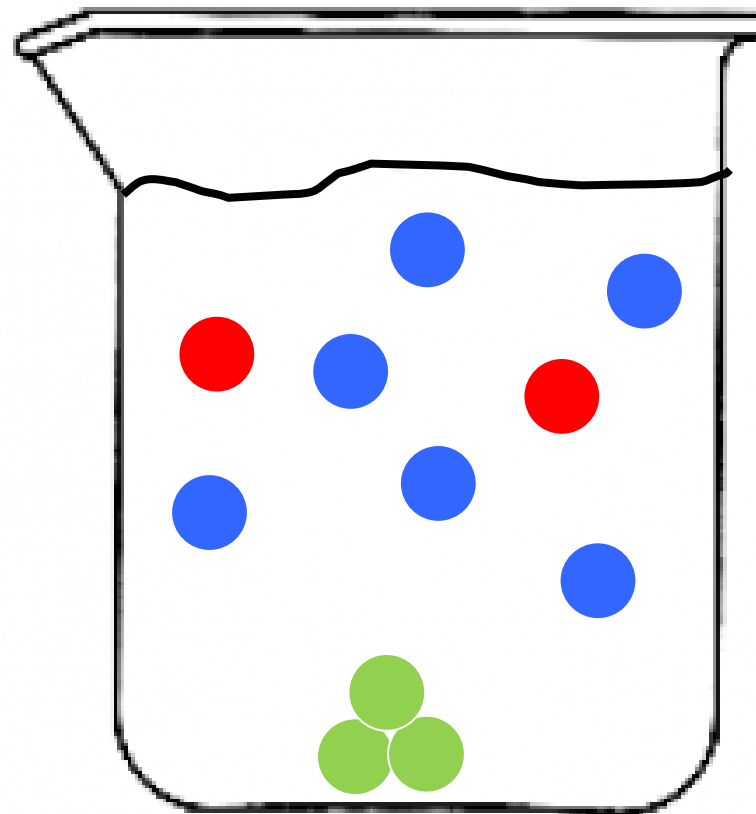
Prediction Products Practice #3

The Balanced Equation



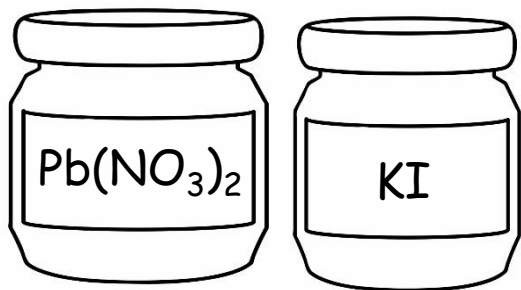
Jars of chemicals
in stock room

Dump into
beaker...



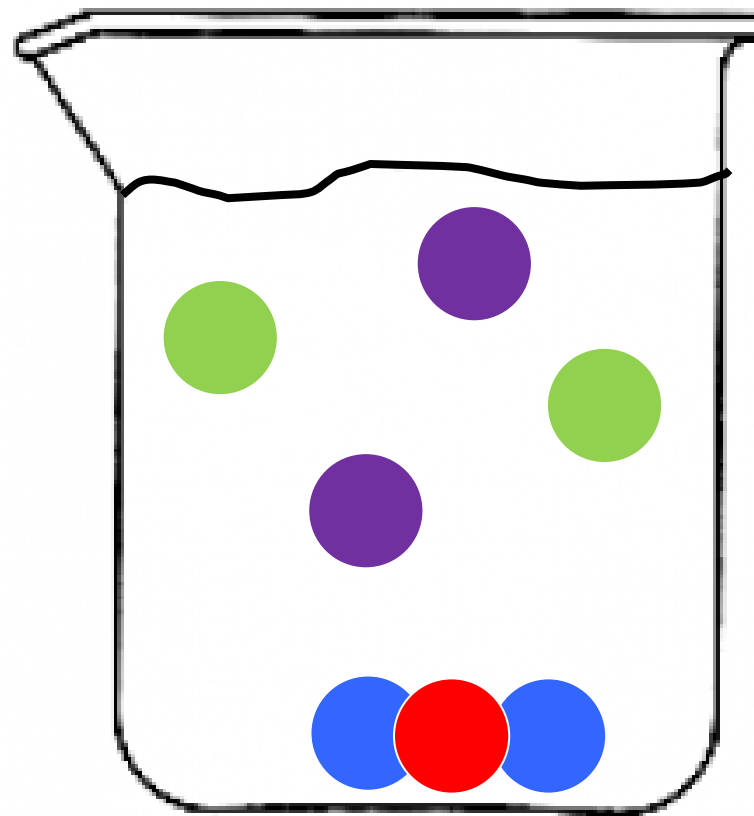
Prediction Products Practice #4

The Balanced Equation



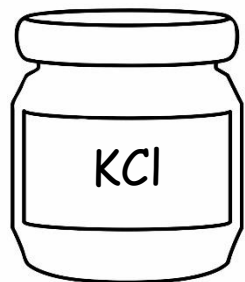
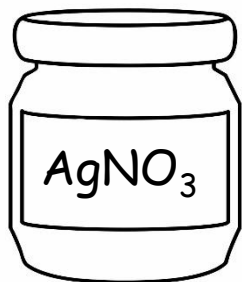
Jars of chemicals
in stock room

Dump into
beaker...



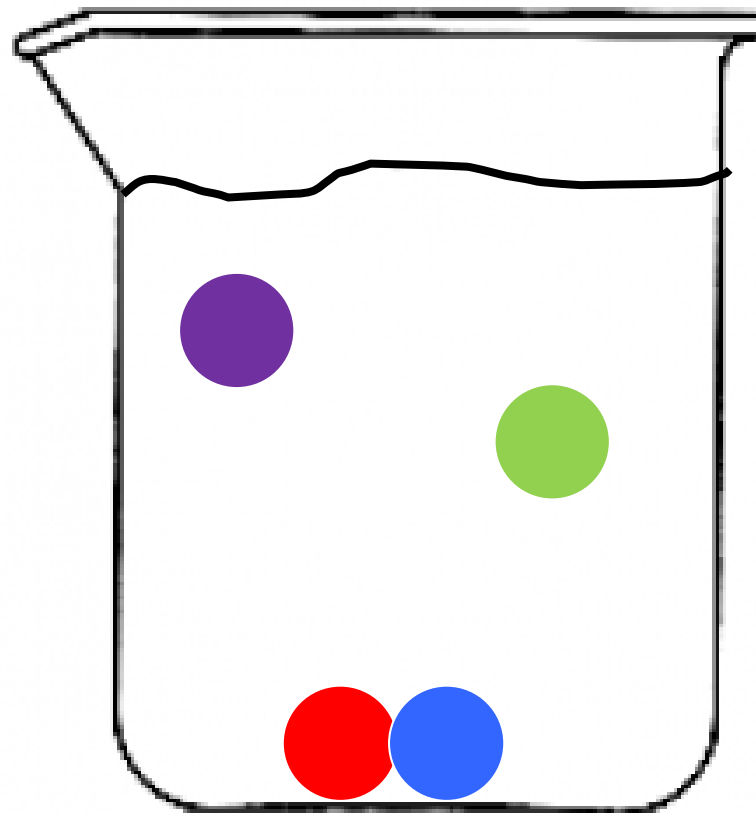
Prediction Products Practice #5

The Balanced Equation



Dump into
beaker...

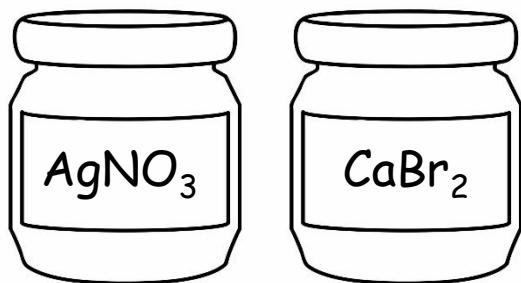
Jars of chemicals
in stock room



New one to try!

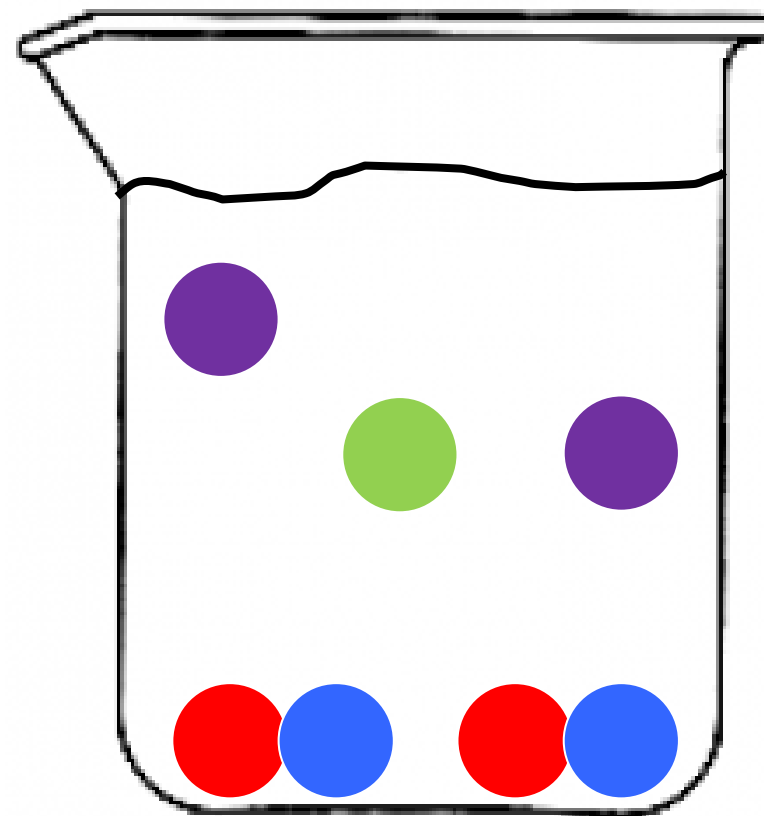
Silver nitrate plus calcium bromide →

The Balanced Equation



Jars of chemicals
in stock room

Dump into
beaker...



YouTube Link to Presentation

This is actually the link to the Honors lecture for a similar presentation! If I get time I will update this with a new video for this AP lecture.

<https://youtu.be/Jw0uwkF568s>