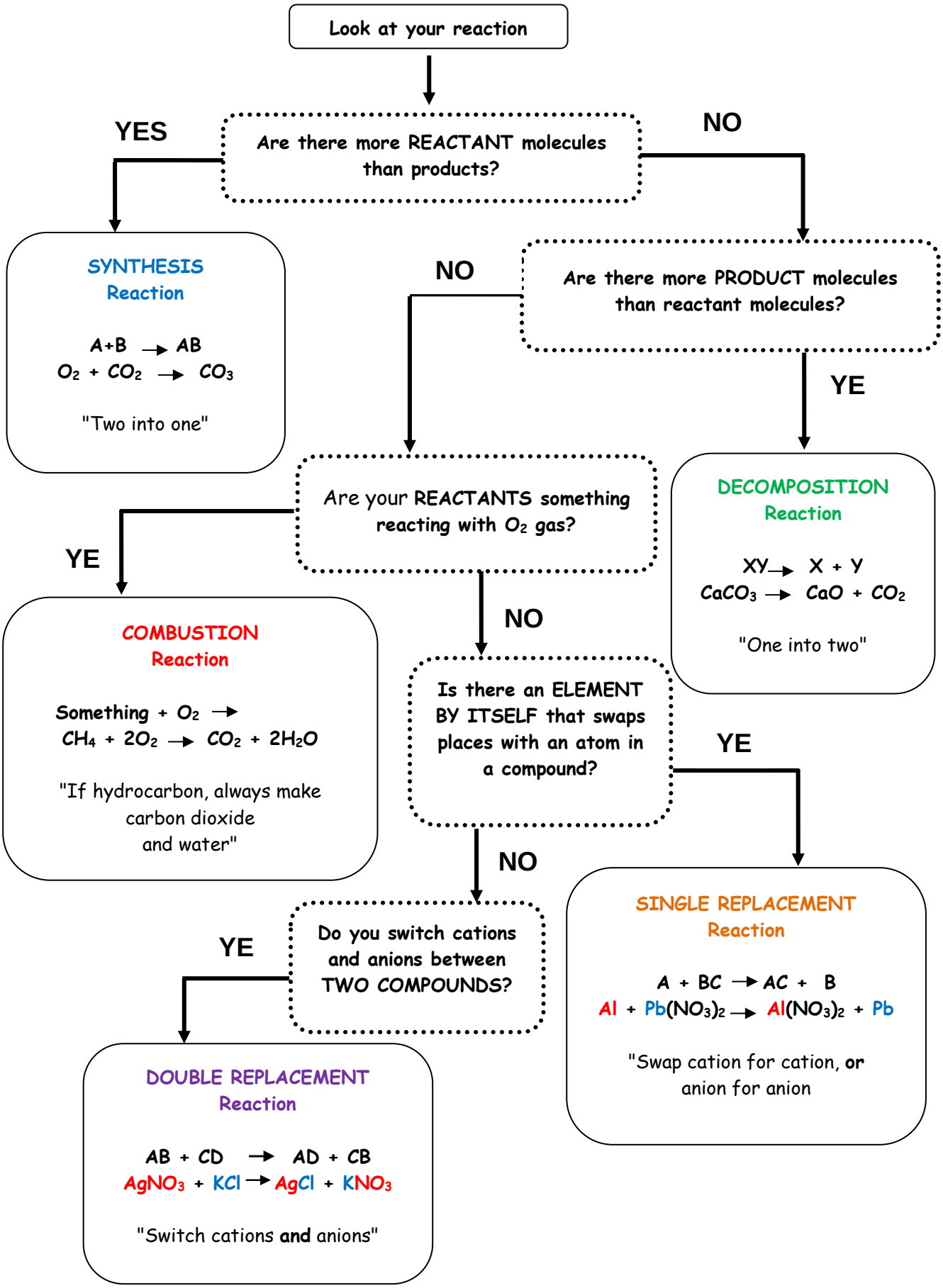
Reference Sheets for Unit #6 – Reactions


Look at your reaction
Are there more REACTANT molecules than products?
YES
NO
SYNTHESIS Reaction
A+B → AB
O2 + CO2 → CO3
"Two into one"
Are there more PRODUCT molecules than reactant molecules?
NO
YE
DECOMPOSITION Reaction
XY → X + Y
CaCO3 → CaO + CO2
"One into two"
Are your REACTANTS something reacting with O2 gas?
YE
NO
COMBUSTION Reaction
Something + O2 →
CH4 + 2O2 → CO2 + 2H2O
"If hydrocarbon, always make carbon dioxide and water"
Is there an ELEMENT BY ITSELF that swaps places with an atom in a compound?
YE
NO
SINGLE REPLACEMENT Reaction
A + BC → AC + B
Al + Pb(NO3)2 → Al(NO3)2 + Pb
"Swap cation for cation, or anion for anion
Do you switch cations and anions between TWO COMPOUNDS?
YE
DOUBLE REPLACEMENT Reaction
AB + CD → AD + CB
AgNO3 + KCl → AgCl + KNO3
"Switch cations and anions"

Activity Series Chart

Metals

Non-Metals

Most Active

Name	Symbol
Lithium	Li
Potassium	K
Barium	Ba
Strontium	Sr
Calcium	Ca
Sodium	Na
Magnesium	Mg
Aluminum	Al
Manganese	Mn
Zinc	Zn
Iron	Fe
Cadmium	Cd
Cobalt	Co
Nickel	Ni
Tin	Sn
Lead	Pb
Hydrogen	H
Copper	Cu
Silver	Ag
Mercury	Hg
Gold	Au

Least Active

Lithium through Sodium can replace a Hydrogen in a water molecule

Magnesium through Lead can replace a Hydrogen in an acid molecule

Name	Symbol
Fluorine	F
Chlorine	Cl
Bromine	Br
Iodine	I

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Elements CANNOT replace anything ABOVE them.
The reaction DOES NOT occur in this situation.

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Examples: $ZnCl_2 + Mg \rightarrow MgCl_2$

Magnesium is above Zinc so the reaction happens

$ZnCl_2 + Cu \rightarrow$ No Reaction

Copper is below Zinc so no reaction happens

Solubility of Some Ionic Compounds in Water

Always Soluble

Alkali metals =	Li^+, Na^+, K^+, Rb^+, Cs^+	AAA CNP
Ammonium =	NH_4^+	
Acetate =	$C_2H_3O_2^-$	
Chlorate =	ClO_3^-	
Nitrate =	NO_3^-	
Perchlorate =	ClO_4^-	

Generally Soluble

Cl^-, Br^-, I^-	Soluble *except*: Ag^+, Pb^{2+}, Hg_2^{2+}	AP-H
F^-	Soluble *except*: Ca^{2+}, Ba^{2+}, Sr^{2+}, Pb^{2+}, Mg^{2+}	CBS-PM
Sulfate = SO_4^{2-}	Soluble *except*: Ca^{2+}, Ba^{2+}, Sr^{2+}, Pb^{2+}	CBS-P

Generally Insoluble

O^{2-}, OH^-	Insoluble *except*: Alkali metals and NH_4^+	AA
	Somewhat soluble: Ca^{2+}, Ba^{2+}, Sr^{2+}	CBS
CO_3^{2-} S^{2-}, SO_3^{2-} PO_4^{3-} CrO_4^{2-}, $Cr_2O_4^{2-}$	Insoluble *except*: Alkali metals and NH_4^+	AA

Not Soluble = forms precipitate

Soluble = dissolves in water (aqueous)