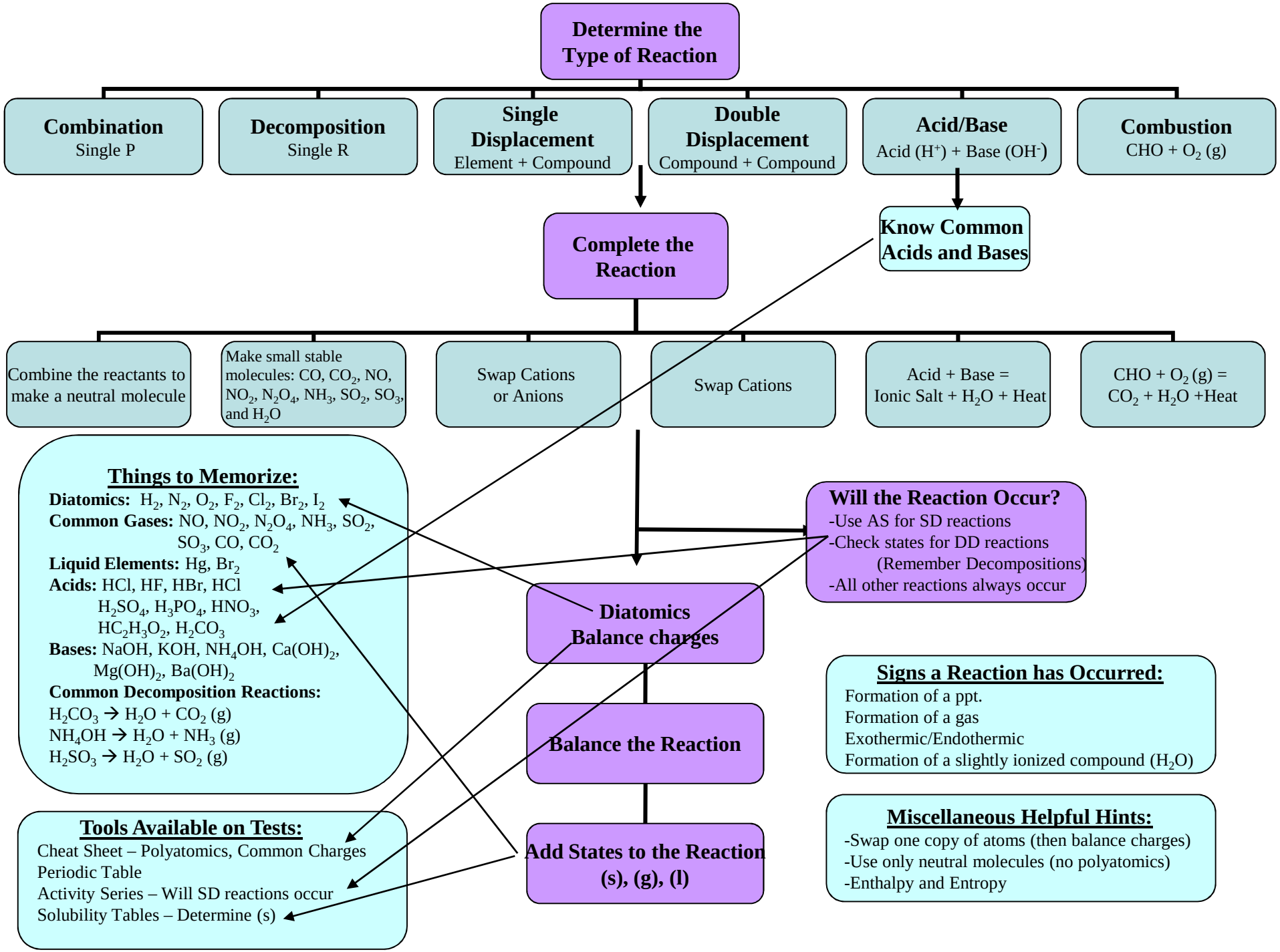
Determine the Type of Reaction
Combination
Single P
Decomposition
Single R
Single Displacement
Element + Compound
Double Displacement
Compound + Compound
Acid/Base
Acid (H^+) + Base (OH^-)
Combustion
CHO + O_2 (g)
Complete the Reaction
Know Common Acids and Bases
Combine the reactants to make a neutral molecule
Make small stable molecules: CO, CO_2, NO, NO_2, N_2O_4, NH_3, SO_2, SO_3, and H_2O
Swap Cations or Anions
Swap Cations
Acid + Base = Ionic Salt + H_2O + Heat
CHO + O_2 (g) = CO_2 + H_2O +Heat
Things to Memorize:
Diatomics: H_2, N_2, O_2, F_2, Cl_2, Br_2, I_2
Common Gases: NO, NO_2, N_2O_4, NH_3, SO_2, SO_3, CO, CO_2
Liquid Elements: Hg, Br_2
Acids: HCl, HF, HBr, HCl H_2SO_4, H_3PO_4, HNO_3, $HC_2H_3O_2$, H_2CO_3
Bases: NaOH, KOH, NH_4OH, $Ca(OH)_2$, $Mg(OH)_2$, $Ba(OH)_2$
Common Decomposition Reactions:
$H_2CO_3 \rightarrow H_2O + CO_2$ (g)
$NH_4OH \rightarrow H_2O + NH_3$ (g)
$H_2SO_3 \rightarrow H_2O + SO_2$ (g)
Will the Reaction Occur?
-Use AS for SD reactions
-Check states for DD reactions (Remember Decompositions)
-All other reactions always occur
Diatomics Balance charges
Balance the Reaction
Add States to the Reaction (s), (g), (l)
Signs a Reaction has Occurred:
Formation of a ppt.
Formation of a gas
Exothermic/Endothermic
Formation of a slightly ionized compound (H_2O)
Tools Available on Tests:
Cheat Sheet – Polyatomics, Common Charges
Periodic Table
Activity Series – Will SD reactions occur
Solubility Tables – Determine (s)
Miscellaneous Helpful Hints:
-Swap one copy of atoms (then balance charges)
-Use only neutral molecules (no polyatomics)
-Enthalpy and Entropy

Determine the Type of Reaction

- **Combination** — Single P
- **Decomposition** — Single R
- **Single Displacement** — Element + Compound
- **Double Displacement** — Compound + Compound
- **Acid/Base** — Acid (H^+) + Base (OH^-) → **Know Common Acids and Bases**
- **Combustion** — CHO + O_2 (g)

Complete the Reaction

- Combine the reactants to make a neutral molecule
- Make small stable molecules: CO, CO_2, NO, NO_2, N_2O_4, NH_3, SO_2, SO_3, and H_2O
- Swap Cations or Anions
- Swap Cations
- Acid + Base = Ionic Salt + H_2O + Heat
- CHO + O_2 (g) = CO_2 + H_2O +Heat

Things to Memorize:

Diatomics: H_2, N_2, O_2, F_2, Cl_2, Br_2, I_2
Common Gases: NO, NO_2, N_2O_4, NH_3, SO_2, SO_3, CO, CO_2
Liquid Elements: Hg, Br_2
Acids: HCl, HF, HBr, HCl
H_2SO_4, H_3PO_4, HNO_3,
$HC_2H_3O_2$, H_2CO_3
Bases: NaOH, KOH, NH_4OH, $Ca(OH)_2$,
$Mg(OH)_2$, $Ba(OH)_2$
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$NH_4OH \rightarrow H_2O + NH_3$ (g)
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Tools Available on Tests:

Cheat Sheet – Polyatomics, Common Charges
Periodic Table
Activity Series – Will SD reactions occur
Solubility Tables – Determine (s)

Will the Reaction Occur?

-Use AS for SD reactions
-Check states for DD reactions
(Remember Decompositions)
-All other reactions always occur

Diatomics Balance charges

Balance the Reaction

Add States to the Reaction (s), (g), (l)

Signs a Reaction has Occurred:

Formation of a ppt.
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