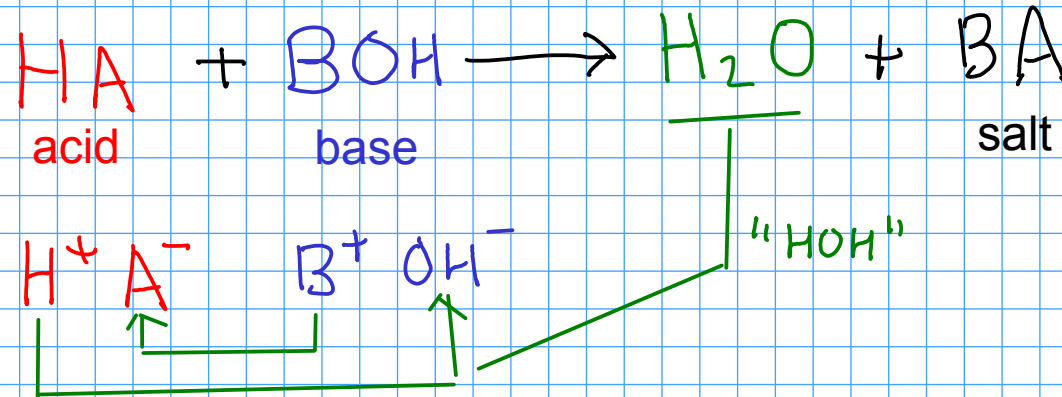


FORMATION OF STABLE MOLECULES

- There are several stable molecules that may be formed in double replacement reactions, but the most common is WATER!
- Double replacement reactions that form water are also called "neutralizations"



* To make water (H₂O), you need a source of hydrogen ion (H⁺) and hydroxide ion (OH⁻)

ACIDS

- compounds that release hydrogen ion (H^+), when dissolved in water.

Properties of acids:

- Corrosive: React with most metals to give off hydrogen gas
- Cause chemical burns on contact
- Taste sour (like citrus - citric acid!)
- Changes litmus indicator to RED

BASES

- Substances that release hydroxide ion (OH^-) when dissolved in water

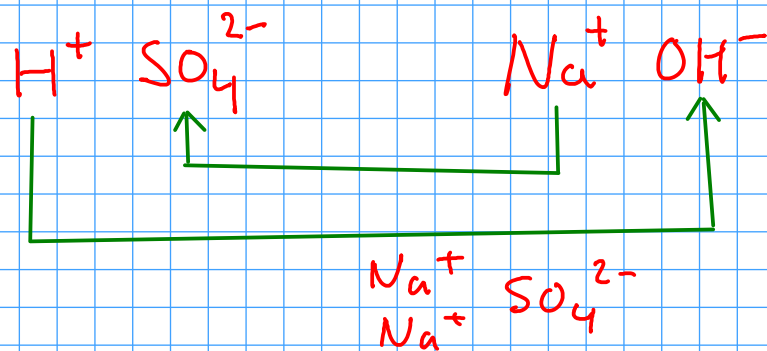
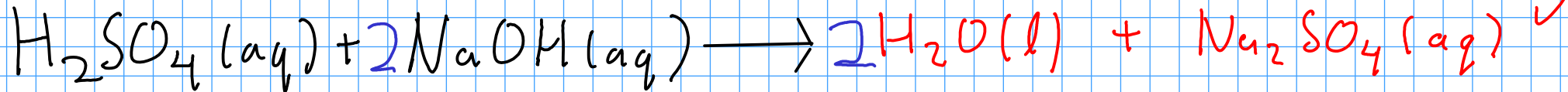
Properties of bases:

- Caustic: Attack and dissolve organic matter (think lye, which is NaOH)
- Cause skin/eye damage on contact
- Taste bitter
- changes litmus indicator to BLUE

Due to the dissolving action of base on your skin, bases will feel "slippery". The base ITSELF is not particularly slippery, but what's left of your skin IS!

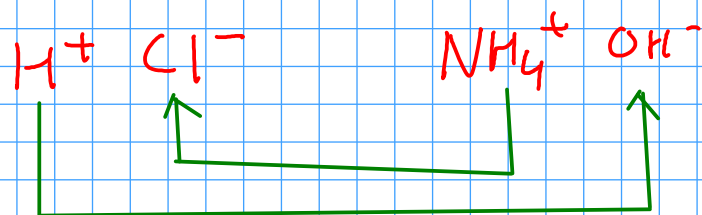
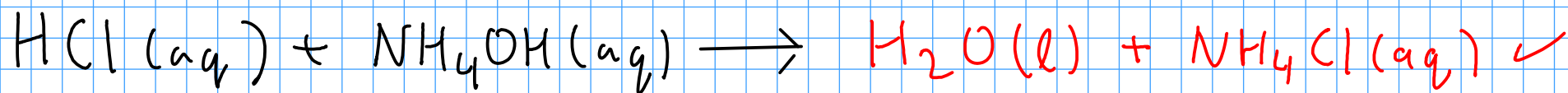
Examples of acid-base chemistry:

When a neutralization reaction occurs, energy is released. There will be a temperature increase!



H_2O , Na_2SO_4

Use the SOLUBILITY CHART on p170 of your textbook to predict whether these substances dissolve!

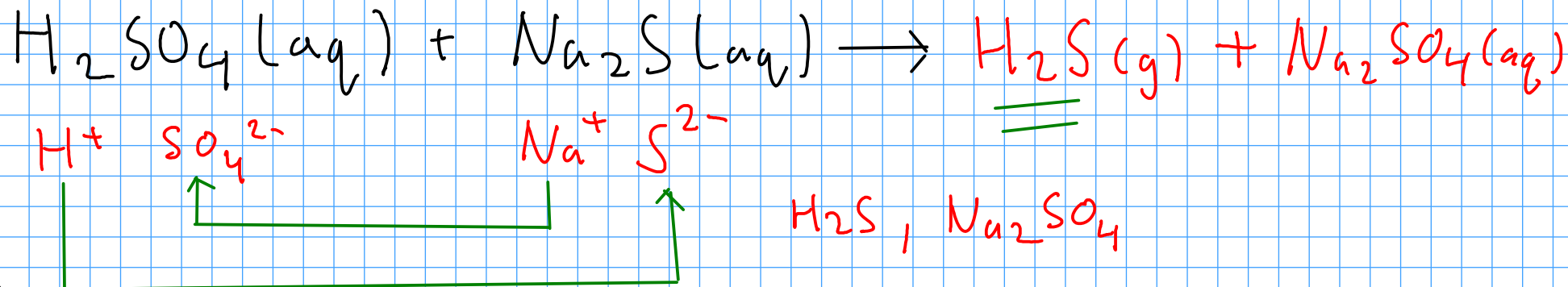


H_2O , NH_4Cl

DOUBLE REPLACEMENTS THAT FORM GASES

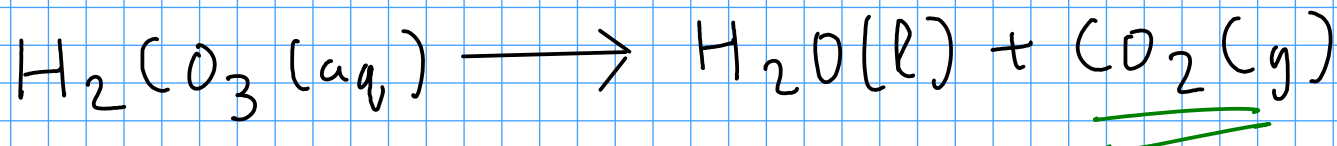
① Formation of hydrogen sulfide: H_2S

- need an ACID (source of hydrogen ion) and a SULFIDE



② Formation of carbonic acid and carbon dioxide:

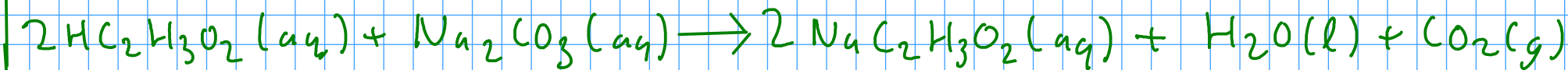
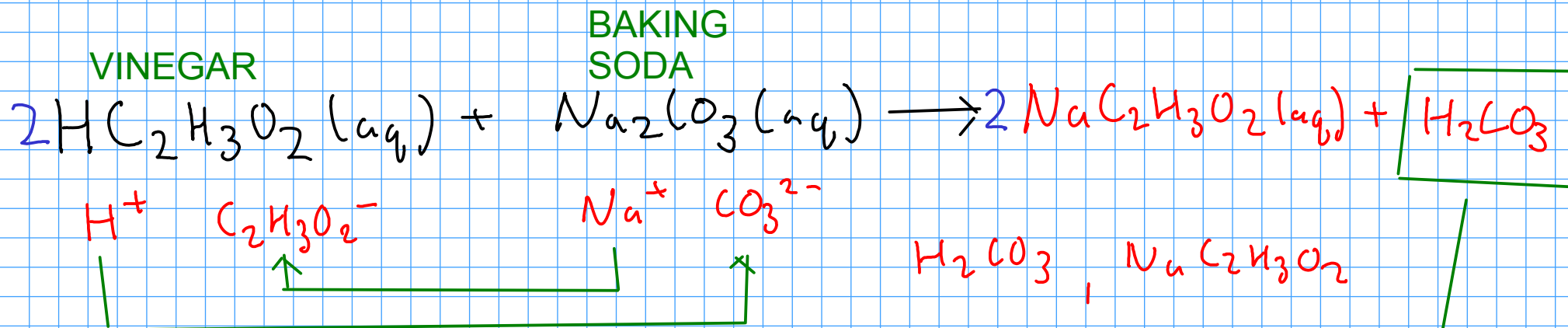
- Carbonic acid DECOMPOSES when formed in double replacement reactions!



- to form carbonic acid by double replacement, you need a source of hydrogen ion (ACID) and a source of carbonate (can be CARBONATE or BICARBONATE)

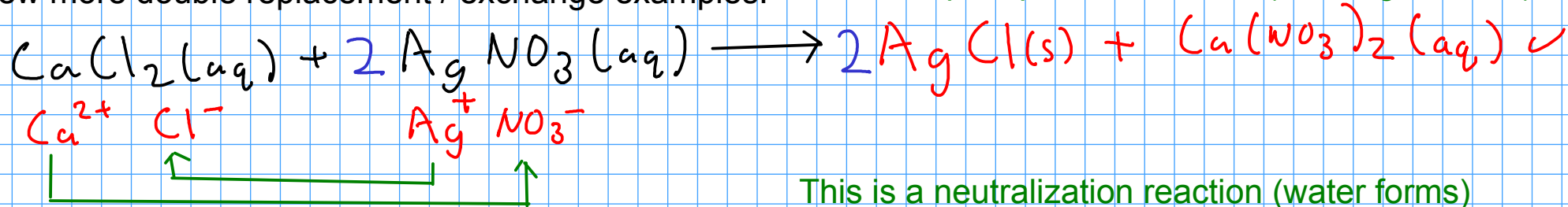


Example of a reactions that forms carbonic acid, then gas: The "baking soda volcano"!

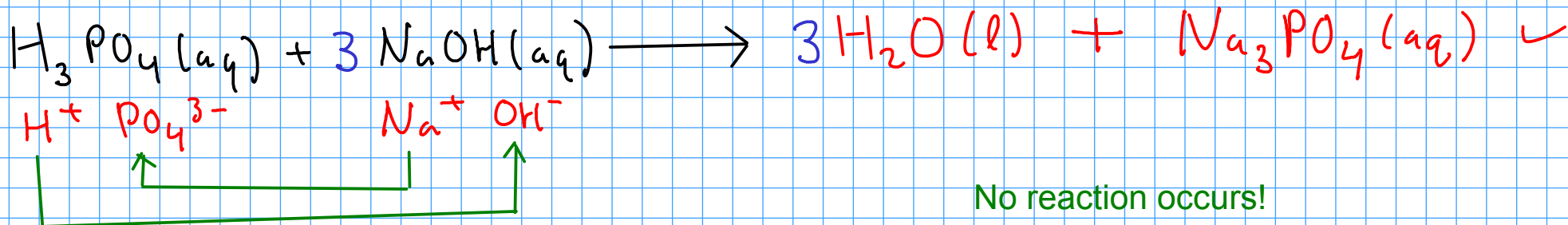


This is the overall process. We show carbon dioxide and water as products, since we want to show the reaction as it's actually observed -with carbonic acid broken down to water and (gaseous) carbon dioxide.

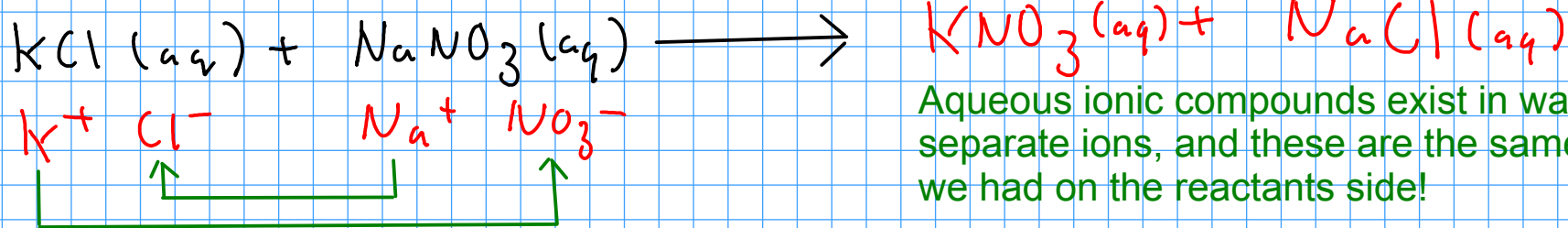
A few more double replacement / exchange examples: This is a precipitation reaction (solid AgCl forms)



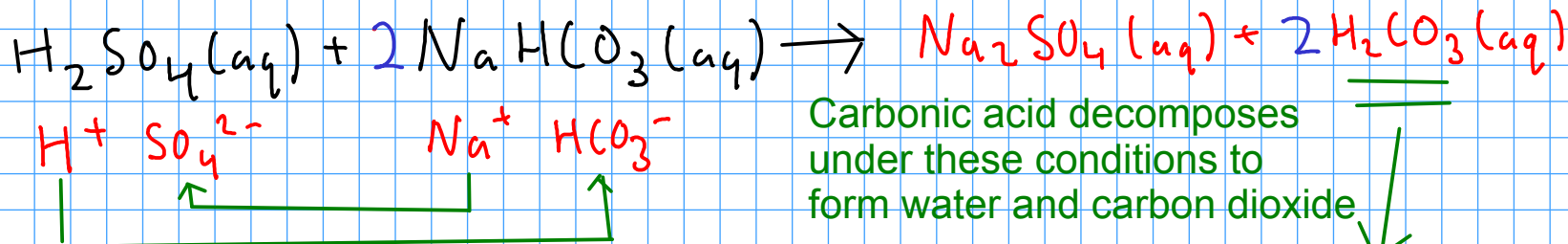
This is a neutralization reaction (water forms)



No reaction occurs!



Aqueous ionic compounds exist in water as separate ions, and these are the same ions we had on the reactants side!



Carbonic acid decomposes under these conditions to form water and carbon dioxide

