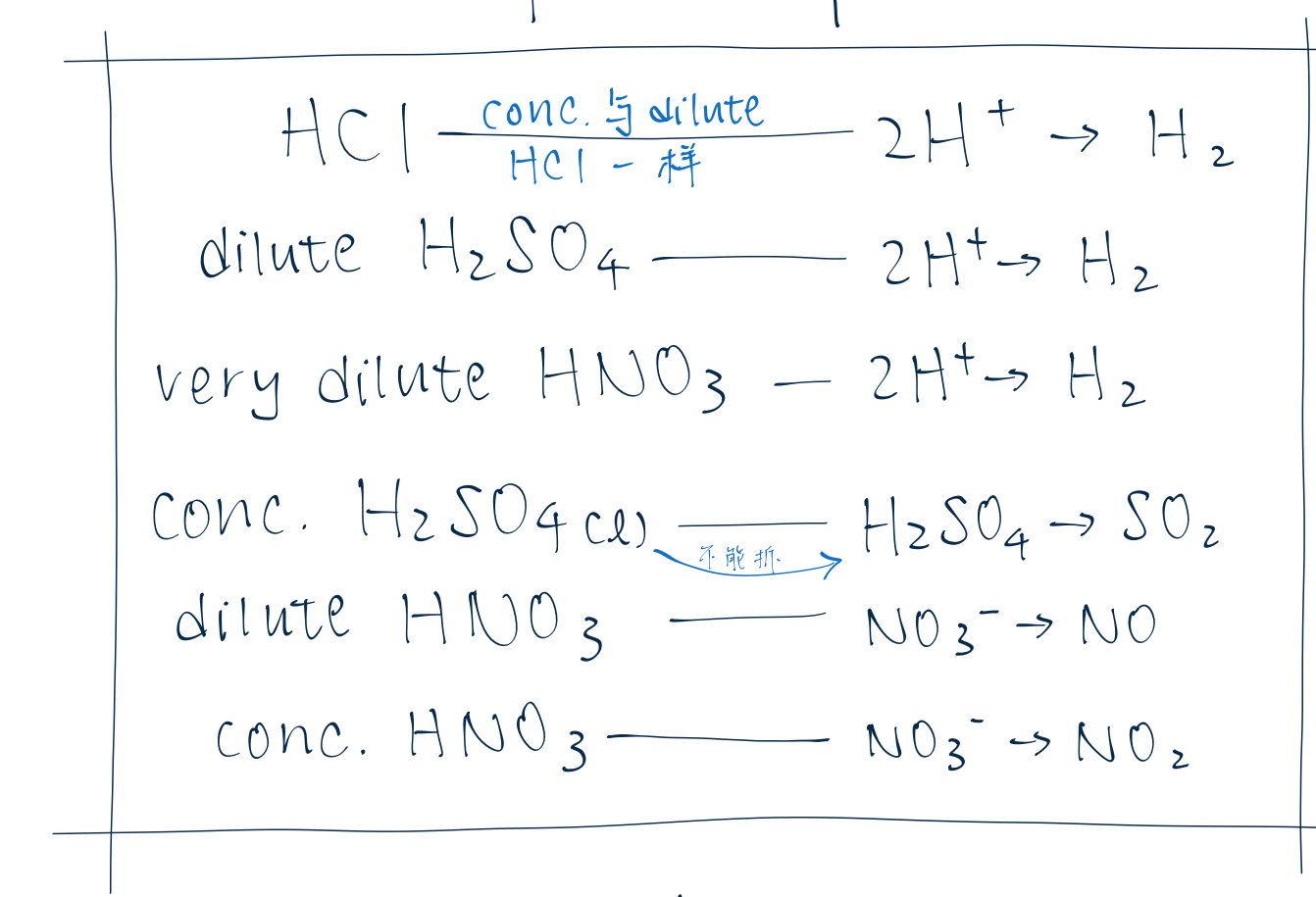


conc. HNO_3 - 不肯定 (系数)
conc. H_2SO_4 - \checkmark

conc. HNO_3 - 不肯定 (系数)
conc. H_2SO_4 - \checkmark

($\text{C} \rightarrow \text{CO}_2$)
($\text{S} \rightarrow \text{SO}_2$)

R.A.③: ions
R.A.②: non-metals



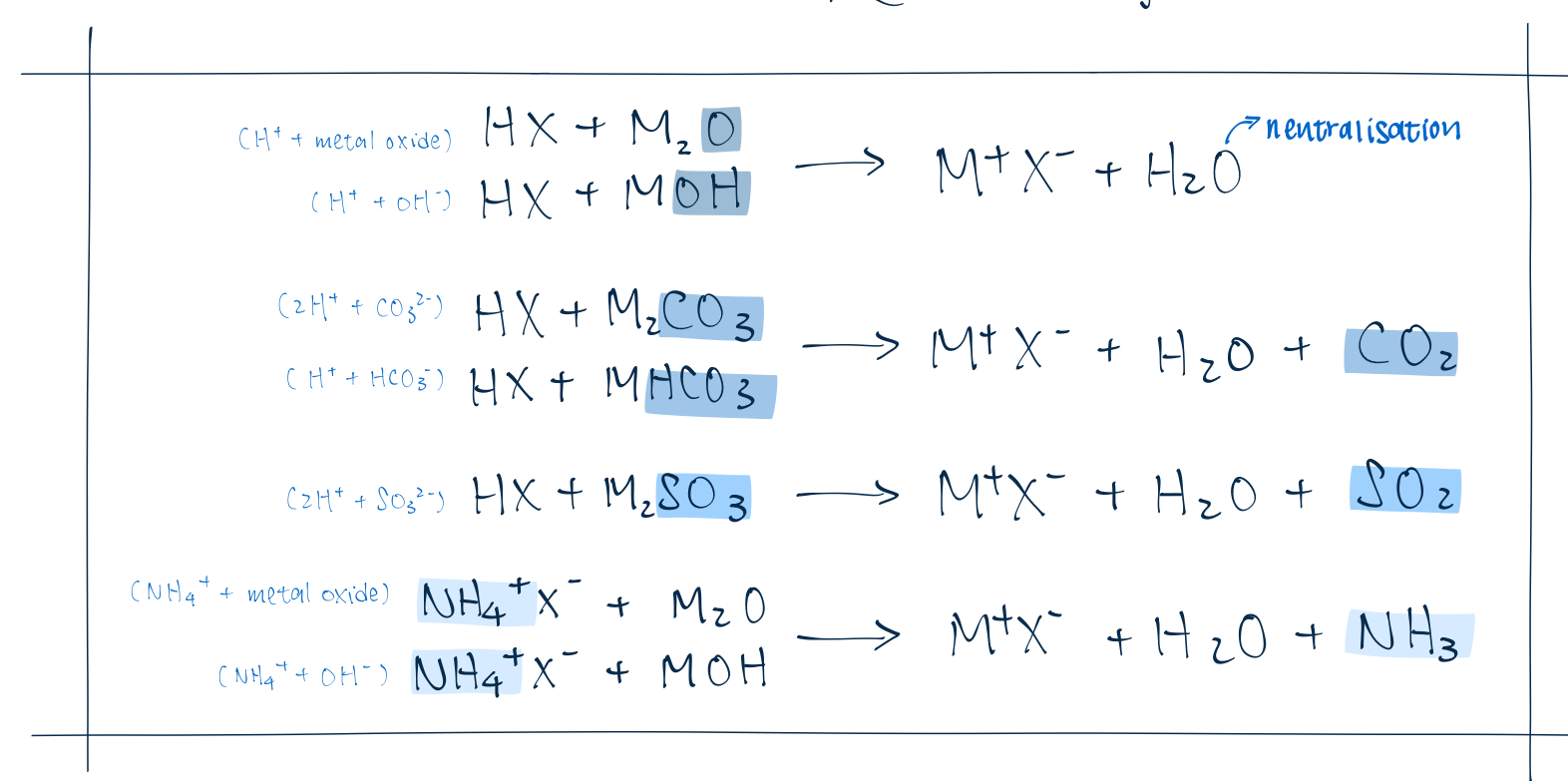
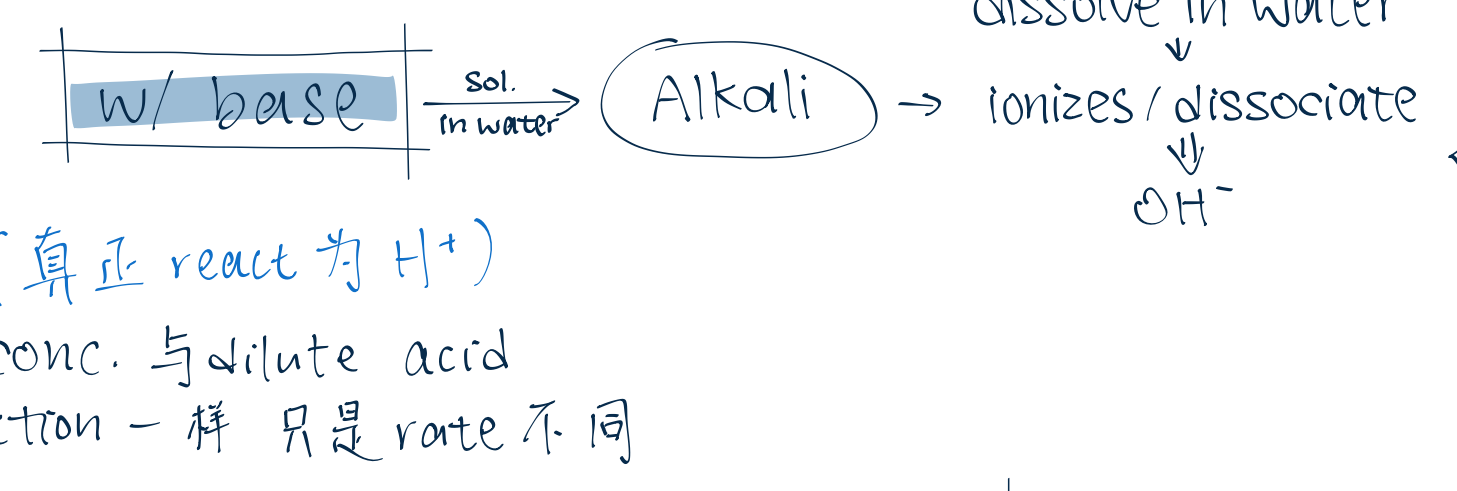
R.A.①: metals
($\text{M} \rightarrow \text{M}^{n+}$)

$\begin{cases} \text{HCl}, \\ \text{dilute H}_2\text{SO}_4, \\ \text{very dilute HNO}_3 \end{cases} \Rightarrow \text{K} \rightarrow \text{Pb}$

$\begin{cases} \text{conc. H}_2\text{SO}_4, \\ \text{dilute HNO}_3, \\ \text{conc. HNO}_3 \end{cases} \Rightarrow \text{all metals}$

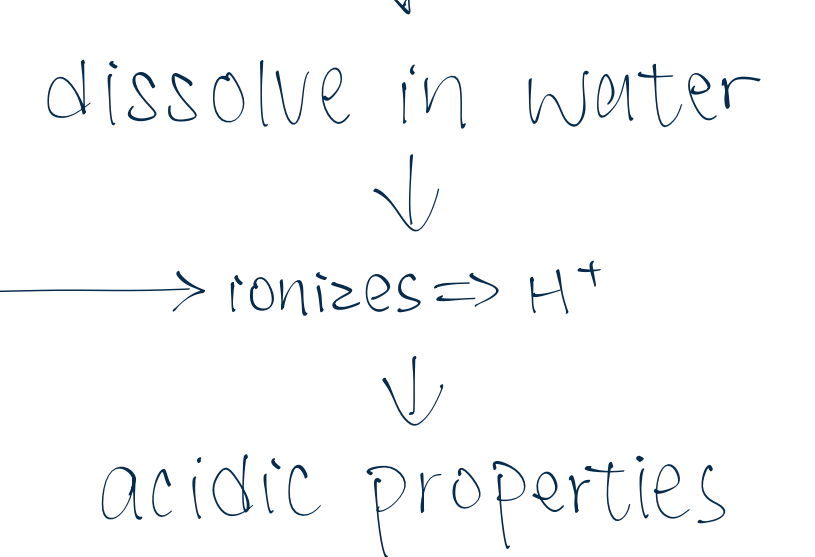
AS an **dehydrator agent**

Acid Reactions



Arrhenius Rule
definition

Acid



basicity - max. no. of ionizable H atoms in an acid molecule

- ① **monobasic** - CH_3COOH ($\text{CH}_3\text{COOH} \rightleftharpoons \text{CH}_3\text{COO}^- + \text{H}^+$) - 只有COOH的H才会掉落
- ② **dibasic** - H_2SO_4 ($\text{H}_2\text{SO}_4 \rightarrow 2\text{H}^+ + \text{SO}_4^{2-}$)
- ③ **tribasic** - H_3PO_4 ($\text{H}_3\text{PO}_4 \rightleftharpoons 3\text{H}^+ + \text{PO}_4^{3-}$) (只是例子, 还有其他的)

conc./dilute - Completely ionize? (水足够 ionize 全部 acid 吗?)

acid reactivity 不同 - reaction 不一样
diluting conc. acid - qualitatively - 酸加水, 慢慢变, 弱变强
quantitatively

Strong/weak - Completely ionize? (is ionization reversible?)

differentiate - chemical - reaction rate
physical - pH paper
electrical - conductivity

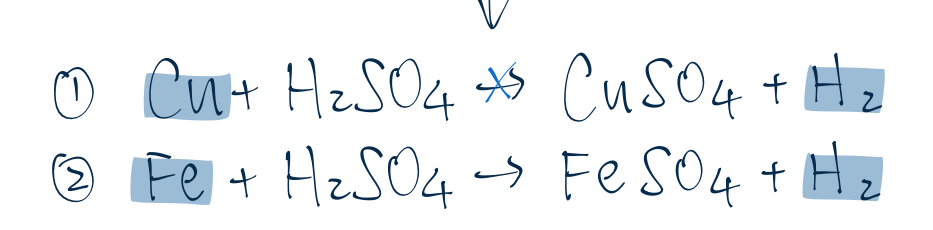
Organic/mineral - 来自生物/矿物? mineral - HCl , H_2SO_4 ... organic - CH_3COOH , citric acid ...

K	时
Mn	时
Fe	时
Al	时
Cr	时
Ni	时
Cu	时
Zn	时
Pb	时
Ag	时
Au	时
Li	时

Reactivity Series

看 reaction 是
① 弱 \rightarrow 强 (x)
② 强 \rightarrow 弱 (x)

判断有没有 reaction?



Redox reactions

Balancing redox eqn.

- 四部曲:
1. 欠O加水
2. 欠H加 H^+
3. 平衡电荷 (加电子)
4. 左右两边的1e-1加埋

Transfer of electrons

