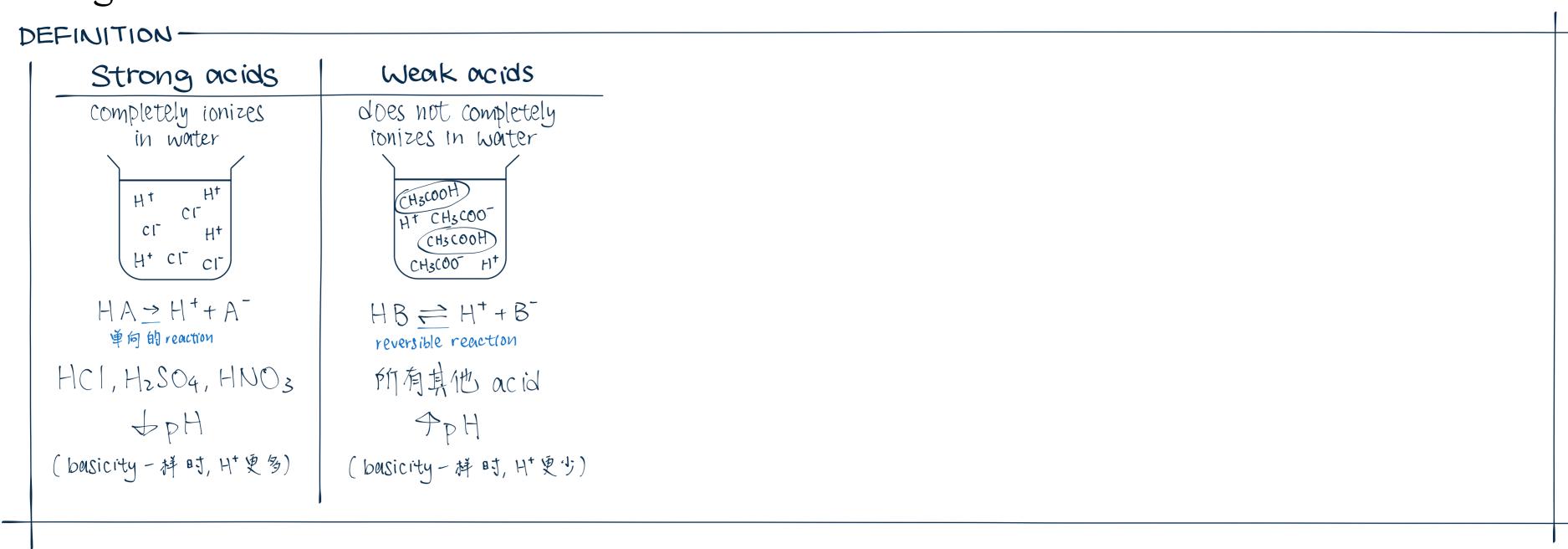
Attributes of acids affecting pH

1 Strong and weak acids



DISTINGUISHING STRONG AND WEAK ACIDS

- eg. HCl and CH3 COOH — basicity与concentration须-样才能比较

PHYSICAL METHOD

a. PH value

- Prepare same volume of 0.1M HClago and 0.1M CH3COOH ago
 - Using PH paper, measure the pH value of both solutions
 - O.IM HCI has a lower PH value than O.IM CH3COOH cags.
 - strong acids -> EH+J+> PH+

b. Electrical conductivity

- Prepare same volume of 0.1M HClag, and 0.1M CH3COOH ago
- Using a light bulb, test the electrical conductivity of both solutions
- 0.1 M HC/ cap provides a brighter light bulb than 0.1 M CH3COOH caop.
- strong acids -> not of mobile ions P -> electrical
- conductivity ?

CHEMICAL METHOD

a. Reaction rate

- React same mass of Iron w/ Same volume of excess O.IM HCI cong) and O.IM CH3 COOH cong) $(Fe + 2H^{\dagger} \rightarrow Fe^{2\dagger} + Hz)$
 - O.IM Helcago gives bubbles at a faster vote.
 - H+浓度个→粒子碰撞频率个→ reaction rate个

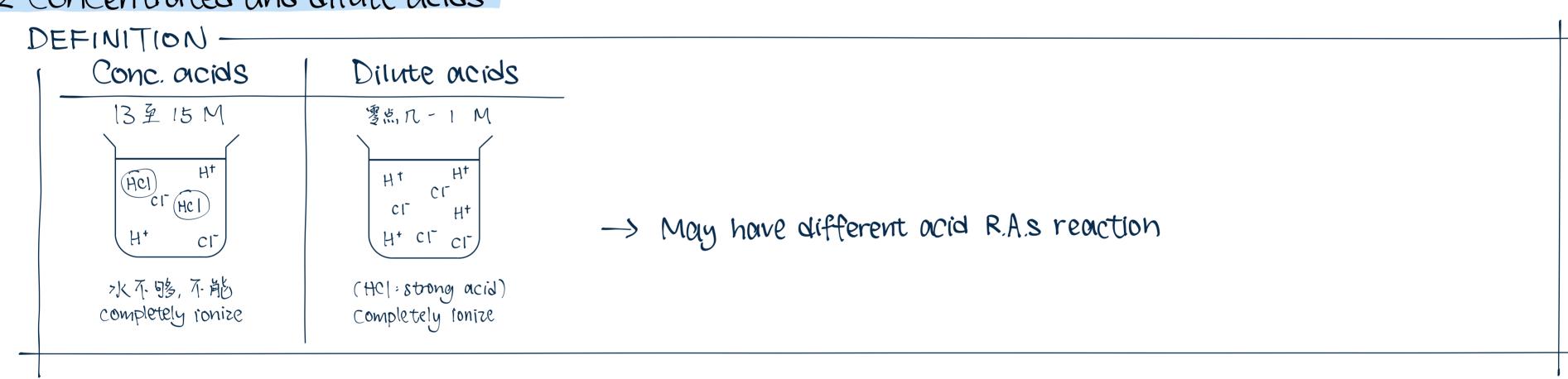
最后Hz的 volume 还是一样的

- 1. limiting reactant 是铁
- 2. reaction 会发热 (exothermic) 放出来的热点使CH3COOH其他molecules conize (温度个, ionize的H+个) 最后所有required的CH3COOH(不包括excess)也会被course了 可是因为热用来了ionize,达成 reaction 本身 activation energy 需时更久
 - Reaction rate +

SHOWING ... IS STRONG/WEAK ACID

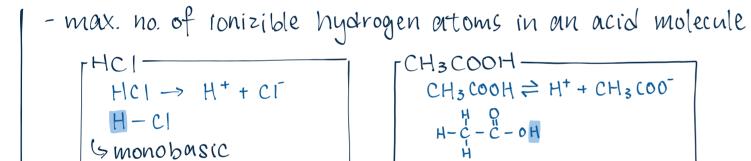
- Prepare 0.1M of the acid. Tassume horsicity=1
- Measure its pH accurately w/pH meter. HX > Ht+x-
- If acid is completely ionized, pH = -log[H+] = -log 0.1 = 1
- SO, if PH = 1 → strong acid. If PH >1 → weak acid

2 Concentrated and dilute acids



3 Basicity

DEFINITION



1 H2 SO4 $H_2SO_4 \rightarrow 2H^4 + SO_4^{2-}$ 40 - 5 = 0

5 dibasic

4 monobasic M3 PO4 $H_3 PO_4 \rightleftharpoons 3H^{\dagger} + PO_4^{3-}$

0=P-0H

5 tribasic

MOLE RATIO OF ACID-BASE REACTIONS

知识点

- Nh acid 自l basicity 和 base anion 自l charge 半小断 mole ratio - 把两个数字调转,再约简

→ HCI + NaOH, basicity = 1, anion charge = -1 -> 1 = 1

-> HzSO4 + NaOH, basicity = 2, anion charge = -1 -> 1:2 -> H3PO4 + Naz CO3, basicity = 3, anion charge = -2 -> 2:3

29 dibasic acid requires 30cm³ of 2.15M NaOH for complete neutralisation. Find its molar mass.

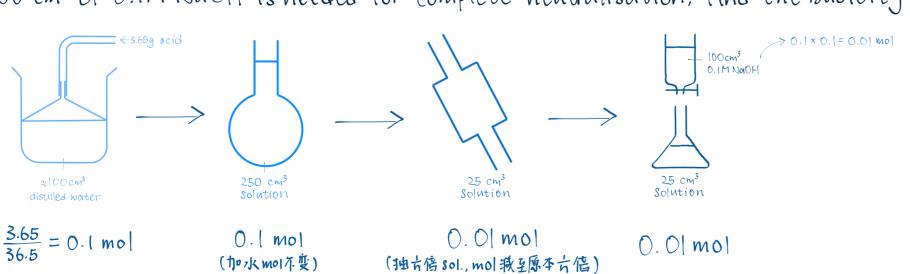
acid mole: NaOH mole = 1 : 2 $N: 2.15 \times 0.03 = 1:2$ mole = molarity x volume n = 0.0325

 $\frac{\text{mass}}{\text{Mr}}$ = mole $\frac{2}{Mr} = 0.0325$

Mr = 62.0

3.65g acid in gas state w/ Mr 36.5 is dissolved completely into 100 cm³ distilled water. The sol is poured into 250 cm3 volumetric flask for dilution.

25 cm³ of the sol. is pipetted out to a conical flask and titrated against 0.1M NaOH. If 100 cm³ of 0.1M NaOH is needed for complete neutralisation, find the basicity of the acid.



mole of acid: mole of alkali = 0.01 : 0.01

= [:] : monobasic

4 Mixed question types

WHICH IS MORE ACIDIC?

→ fair test — conc./dilute - 样
basicity - 样
strong/weak 不一样 O.IM CH3COOH O.IM HCI 0.1M H2CO3 可是复际上strength ← 在weak acid里,只有几% CX fair test) Strong/weak 不一样 O.IM HCI 的 ionizable H atom 会 ionize