Exp 4 Acid and Bases

Acid :- Substance that give H^+ when dissolve in H_2O

Base : " " " OH^- " " "

$HCl \longrightarrow H^+ + Cl^-$

$NaOH \longrightarrow Na^+ + OH^-$

$HCl + H_2O \longrightarrow H_3O^+ + Cl^-$ (Bronsted Lory)

$NaOH + H_2O \longrightarrow OH^- + Na^+$

pH < universal Indicator, Litmus paper, pH meter.

$pH = -\log[H_3O^+] = -\log[H^+]$

as pH ↑ $[H_3O^+]$ ↓

0 acidic 7 neutral Basic 14

$pH + pOH = 14$

$pOH = -\log[OH^-]$

Exp 4. Acid and Bases

6M HCl | 0.1 M HCl | 0.01 M HCl

6M HCl Rate > 0.1M > 0.01M

H^+ when dissolve in H_2O

	Mg	Zn	Cu
6M HCl	fast	fast	slow N.R
6M H_3PO_4	Medium	slow	slow N.R
6M CH_3COOH	Slow	Slow	slow N.R

as conc ↑ Rate ↑ Time ↓

HCl > CH_3COOH

Time ↓

pH — universal Indicator
- Litmus paper
- pH meter.

$Mg_{(s)} + \overset{+1}{H}Cl \longrightarrow H_2 + Mg^{+2}Cl_2$

(H: Reduction; Mg: oxidation)

$pH = -\log[H_3O^+] = -\log[H^+]$.

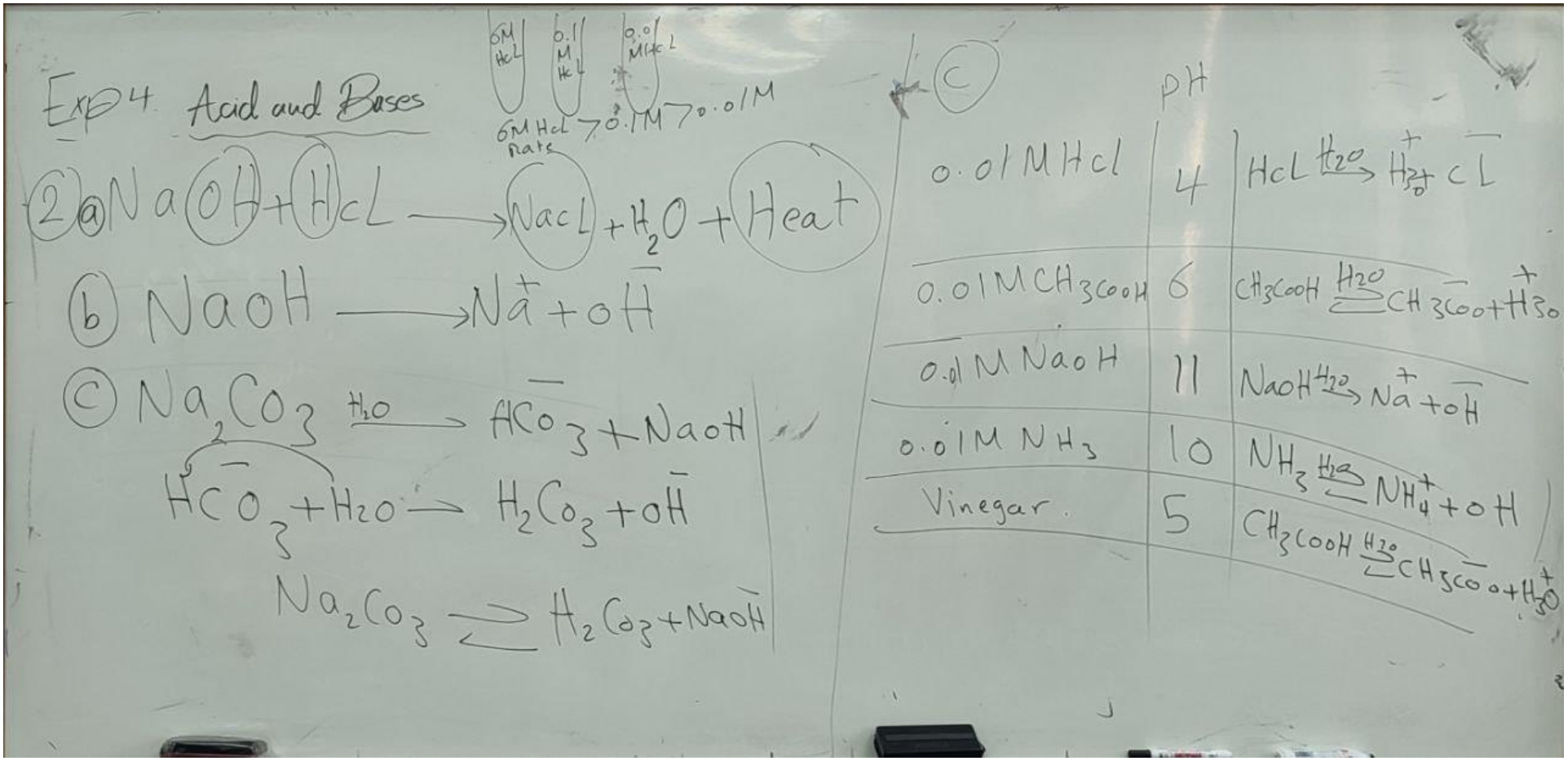
as pH ↑ $[H_3O^+]$ ↓

acidic — neutral — Basic

0 — 7 — 14

$pH + pOH = 14$

$pOH = -\log[OH^-]$


Exp 4 Acid and Bases
6M HCl
0.1 M HCl
0.01 M HCl
6M HCl > 0.1M > 0.01M
Rate
2 (a) NaOH + HCl → NaCl + H2O + Heat
(b) NaOH → Na+ + OH−
(c) Na2CO3 H2O → HCO3− + NaOH
HCO3− + H2O → H2CO3 + OH−
Na2CO3 ⇌ H2CO3 + NaOH
(c)
pH
0.01 M HCl | 4 | HCl H2O → H3O+ + Cl−
0.01 M CH3COOH | 6 | CH3COOH H2O ⇌ CH3COO− + H3O+
0.01 M NaOH | 11 | NaOH H2O → Na+ + OH−
0.01 M NH3 | 10 | NH3 H2O ⇌ NH4+ + OH−
Vinegar | 5 | CH3COOH H2O ⇌ CH3COO− + H3O+