

when air closed → Safety flame
نورنا اوجر

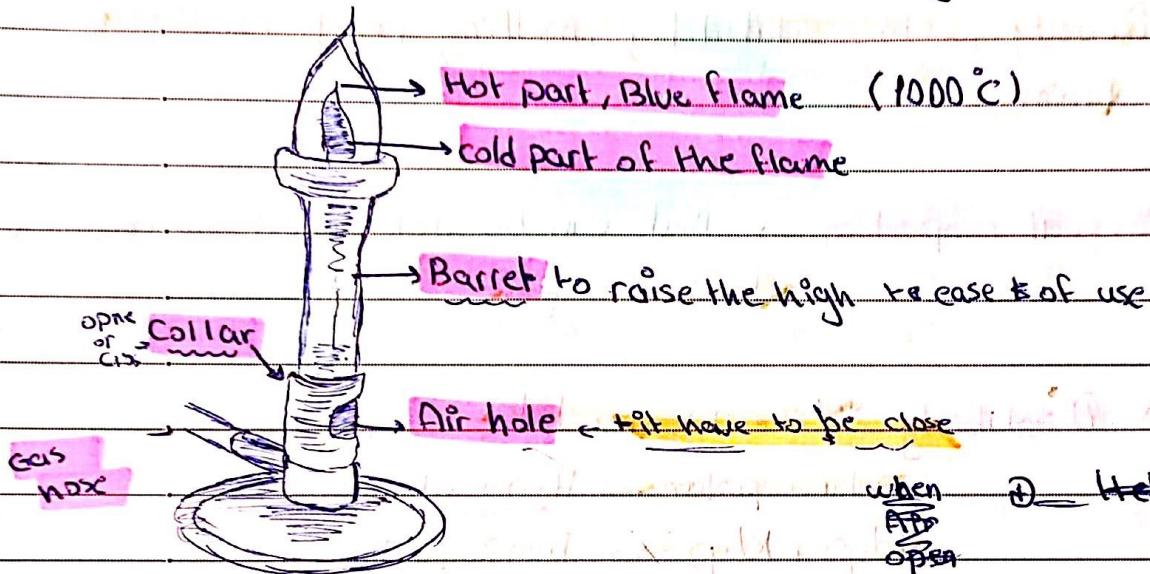
when air open → Heating flame
نورنا ازور

→ نورنا اوجر و نورنا ازور

ext:

⊗

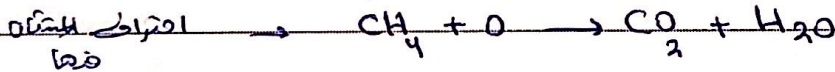
⊕ Bunsen Burner → used to heating in the lab



سینس

→ energy

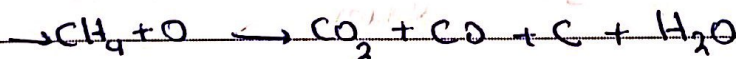
→ blue, non luminous flame → sufficient oxygen



موزنه
باکسین
کاس

سینس

→ yellow, luminous flame → insufficient



⊕ Balance

Type → ① Triple-beam → nearest 0.1g

② Top-loading → 0.1 - 0.001

③ analytical → 0.0001

→ Density → $\frac{m}{V}$, intensive properties

g/cm³ → solid g/l → liq , all for gas

Ex 2: Physical properties

Density, color, solubility, melting point, boiling point

Physical property → that can be determined or measured without changing

1) Solubility "Like dissolve like"

polar + polar → H₂O + ethanol

N.p. + N.p. → benzene + Toluene

الذائب → maximum mass of sub that dissolves in fixed mass

salt will diss in water easily but dirt not

2) Density → $\frac{\text{mass}}{\text{volume}}$

↓ alcohol
oil
water
corn ↑

3) Boiling point

molecular weight \uparrow \rightarrow B.P \uparrow

p non.p

H-bonding $>$ dipole-dipole $>$ London

③ if the boiling point is recorded when bubbles
 \rightarrow its recorded too high

④ if the b.p recorded after liquid enters the tube
its too low

Ex 3: Chemical properties

Sodium: extremely metal

Chlorine: yellow gas, highly reaction

↓
No color
No odor

① Involved when a sub interacts with another sub to change
its chemical make-up

② Observation of Chemical Reaction

③ Evaluation of gases (Bubble, vapor)



CO_2 gas
بازو

$\text{CO}_2 + \text{H}_2\text{O}$

gas without odor



NH_3 gas
بازو

↓ need warm

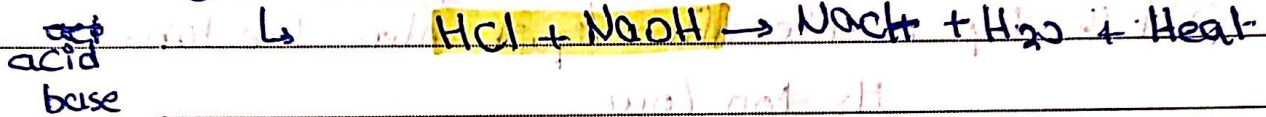
$\text{NH}_3 + \text{H}_2\text{O}$

gas
with odor
with odor

② Formation of precipitate



③ Temperature



④ Color change

↳ bromine + alken



Reddish brown No color

	$\text{NH}_3(\text{aq})$	$\text{HCl}(\text{aq})$	$\text{H}_2\text{SO}_4(\text{aq})$
Ag^+	N.C	white ppt	N.C
Ba^+	/	/	white ppt
Mg^{+2}	white ppt	/	/
Cu^{+2}	Blue ppt	/	/

EX : 4 : Limiting Reactants

⊕ limit →

کام

⊕ excess →

reacted
unreacted

ليس کام

⊕ Percent yield = $\frac{\text{Actual yield}}{\text{Theoretical}} \times 100\%$

Theoretical →

⊕ عدد اموال →

مسایله

3

⊕ Digesting : ~~heat~~ under

heat

کام

EX : 5. Acids and Bases

⊕ متعلقہ الاموال والقواعد

⊕ Arrhenius

⊕ Acid → 1 H^+ or H_3O^+

water water

⊕ Base → 1 OH^-

بجیر منبج

⊕ Bronsted Lowry → most have both acidic - b →

⊕ Acid → proton donor

ba → r → b

⊕ Base → proton acceptor

⊕ produce hydrogen H^+

⊕ کام الاموال

⊕ taste sour

⊕ $pH < 7$

⊕ feel blue → red

الاسيد ← الأحماض



① acids + active metals → salts + hydrogen gas



② acids + Bases → salt + water



inorganic acid → HCl, HNO_3 , phosphoric acid

organic acid → vinegar, citric acid, Vitamin C

① خواص الأحماض

② produce hydroxide OH^- ③ taste bitter

④ red → blue ⑤ $pH < 7$

⑥ soapy feel

① $pH \rightarrow H_3O^+$

lower pH value → stronger acid

Higher pH → stronger base

7.5 ← blood 2.0 ← lemon ①

5.5 ← rain

الأسيد ← الأحماض ← pH

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

$pH + pOH = 14$

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

K potassium
 Na sodium
 Ca
 Mg
 Al
 C
 Zn
 Fe
 Sn
 Pb
 H
 Cu
 Ag
 Au
 Pt

↑
 most reactive
 ↓
 least reactive

⊕ Reduction and oxidation → Same time
 redox

→ very rapid reaction → K, Na
 Rapid reaction → Ca, Mg
 Slow reaction → Al, Zn, Fe, Sn
 No reaction → Pb, Cu, Ag, Au

Ex 6: Antacid Analysis

⊕ Antacids exes HCl acid in the stomach

- ① acide indigestion
- ② heartburn

too much acid → heartburn

hydrochloric acid

⊕ Antacids

⊕ Antacids neutralize → the excess HCl to relieve acid indigestion

⊕ التقليل من حموضة المعدة

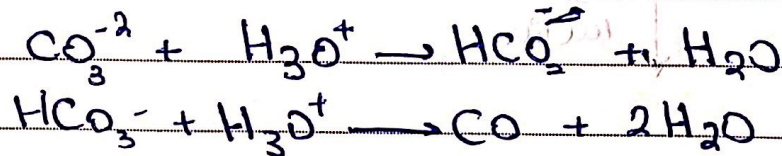
Then

aluminum hydroxide $Al(OH)_3$, $CaCO_3$, $MgCO_3$, $Mg(OH)_2$, $NaHCO_3$, $KHCO_3$

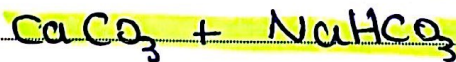


← التغيير في الرقم الهيدروجيني

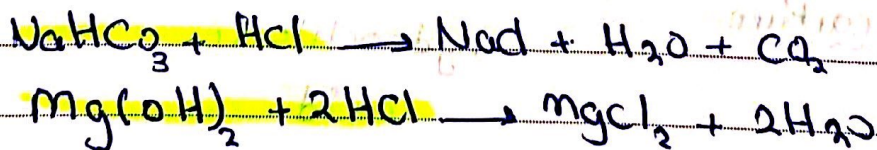
⊕ buffer system → stomach → HCO_3^- / CO_3^{2-}



⊕ The more common (faster relief) in the stomach



⊕ $NaHCO_3$ is milk of magnesia $Mg(OH)_2$



acid → **Indicators** → يتفاعل مع الحمض والقاعدة
 مستخدم لتحديد ال pH

① **Thym Cyanidin** → للحمض بطيخ لون أحمر
 pH 3
 والقاعدة لون أزرق
 pH 11

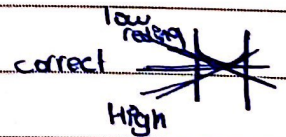
② **Bromophenol** → للحمض لون أصفر
 pH 3.5
 والقاعدة لون أزرق
 pH 4.6

③ **Phenolphthalein** → Colorless → حمض أو قاعدي للقاعدة
 pH = 0 - 8.3
 pink → pH = 8.3 - 10 ← قاعدية

$$M_{acid} \times V_{acid} = M_{base} \times V_{base}$$

← مولات الحمض = مولات القاعدية

$$n_{untreated} = n_{acid} = n_{base}$$



E