

~~Moath
Dwell~~

و) $\frac{m}{V}$
(1) $\frac{m}{V} = \frac{m}{V}$

1) Density = $\frac{\text{Mass}}{\text{Volume}} \approx \frac{g}{mL/cm^3}$

2) * Mass of water lost upon heating
= Mass of alum - Mass of anhydrous

→ Moles = $\frac{\text{Mass}}{\text{Molar Mass}}$

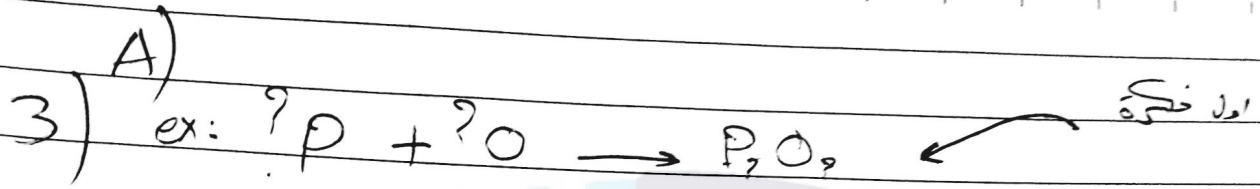
x percentage of water of crystallizing by Mass

= Mass of lost upon heating $\times 100\%$

→ value of "x" = $\frac{\text{moles of water}}{\text{moles of anhydrous salt}}$

$\frac{(\text{Mass of alum} - \text{Mass of water})}{MM \text{ of anhydrous}}$

$\frac{(\text{Mass of alum} - \text{Mass of anhydrous})}{MM \text{ of water}}$



$$\text{Mass of white oxide (P}_2\text{O}_5) - \text{Mass of (P)}$$

$$= \text{Mass of (O}_2)$$

$$\rightarrow \frac{\text{Mass}}{\text{MM}} = \text{moles of O}_2 \text{ and P}$$

empirical formula $\rightarrow P_nO_m$
 division by smallest number of moles

$$\rightarrow \text{mass percent of "X" in } XO \text{ (oxide)}$$

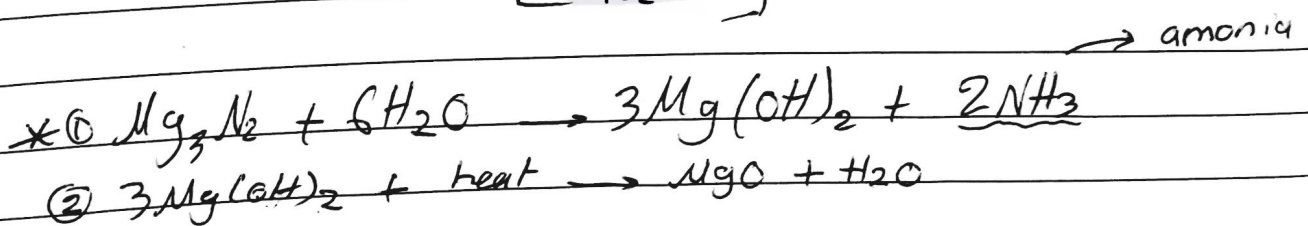
$$= \frac{\text{mass X}}{\text{mass XO}} \times 100\% \Rightarrow \text{experimentally } \underline{\underline{x_1}}$$

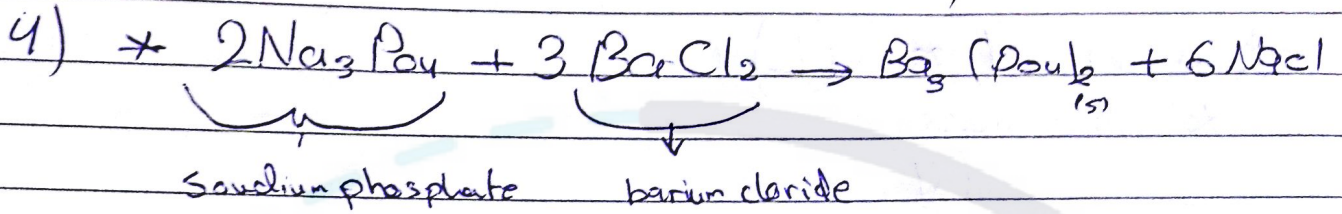
~~percent error~~

Mass percent of Mg in MgO (calculated)

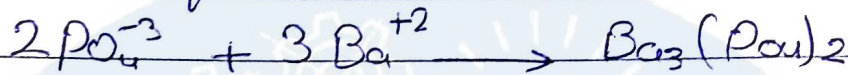
$$= \frac{\text{Molar Mass of Mg}}{\text{Molar Mass of MgO}} \times 100\% \quad \underline{\underline{x_2}}$$

$$\rightarrow \text{percentage error} = \left[\frac{|x_2 - x_1|}{x_2} \right] \times 100\%$$





* net Ionic equation :-



* if we have masses \rightarrow moles

"moles" limiting reactant \leftarrow limiting reactant

moles of product \rightarrow mass by $= n \times M_u$

* Mass of excess =
 Mass of salt mix - (Mass of limiting + Mass of Ba...)

* Mass percentage of limiting = $\frac{\text{Mass of limiting} \times 100\%}{\text{Mass of salt mix}}$

* test for excess of PO_4^{3-}
 we add 2 drop of BaCl_2 solution to beaker if precipitate forms then PO_4^{3-} excess or limiting

* test for excess BaCl_2

$$5) * n = M * V(L)$$

$$* n = \frac{\text{mass}}{MM}$$

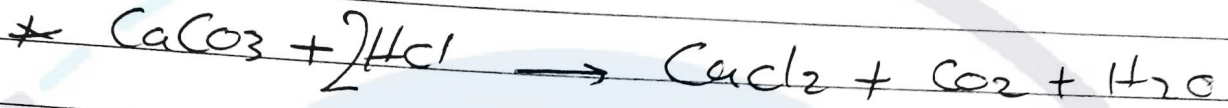
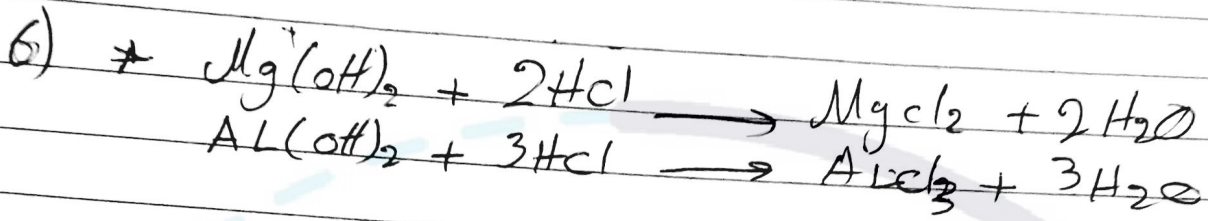
→ Number of moles of base = Number of moles of acid

* if the Indicator phenolphthalein, which is colorless in acid and pink in base

* we have volume and we have molarity → moles of base
molarity ← moles of acid
mass ← $\times MM$ ← 1:1

* Mass percent acetic acid in Vinger

$$= \frac{\text{Molarity} \times MM}{10 \times \text{density}} \%$$



* Mass of antacid sample
 ~~~g

HCl

NaOH

$n_1 = V \times M$

$n_2 = V \times M$

used to dissolve antacid.

buret reading

same HCl

~~$n_{excess\ HCl} = n_1 - n_2$~~

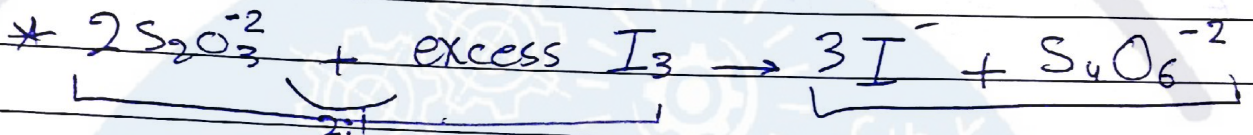
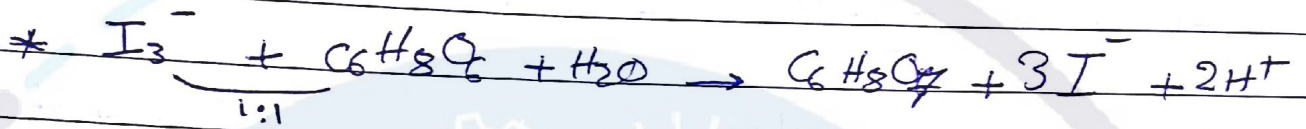
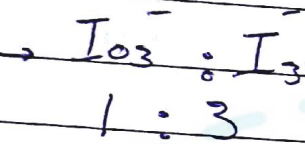
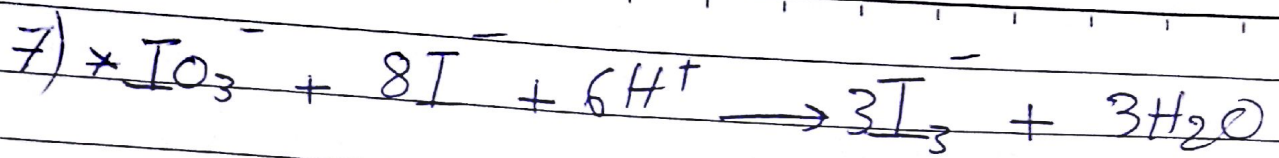
|                                  |
|----------------------------------|
| $n_{excess\ of\ HCl}$<br>$= n_2$ |
|----------------------------------|

$n_{nut} = n_1 - n_2$

needed to neutralize antacid tablet

\* Neutralizing capacity of antacid

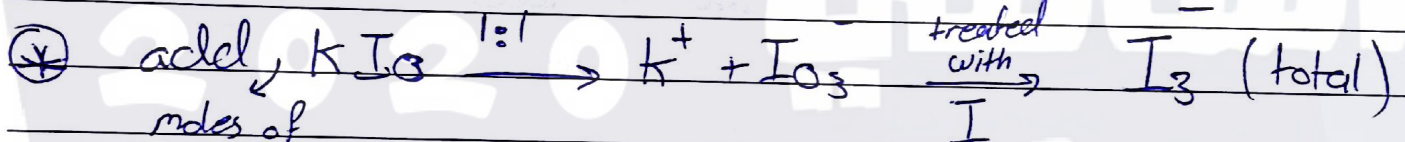
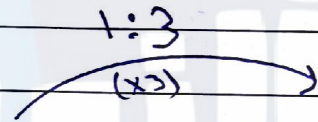
$= \frac{n_{nut}}{\text{Mass of antacid}}$



deep blue

colorless

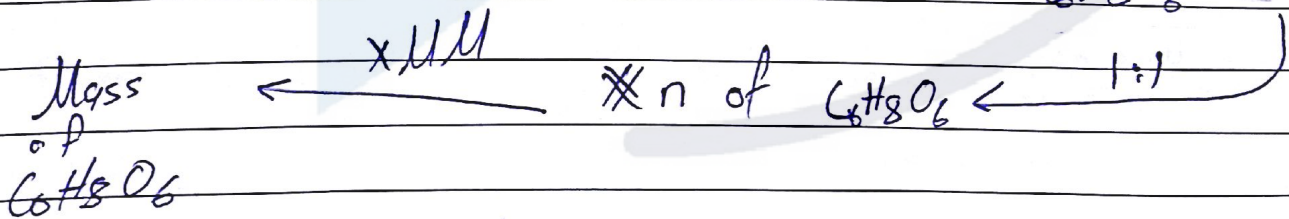
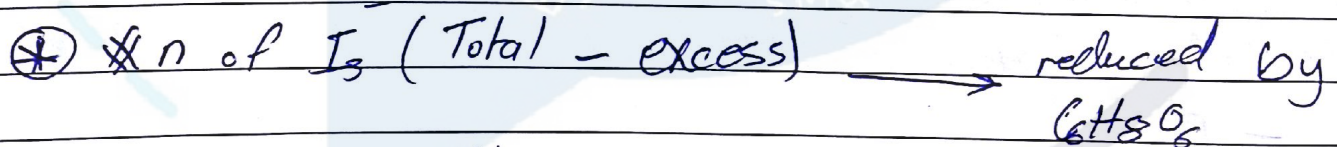
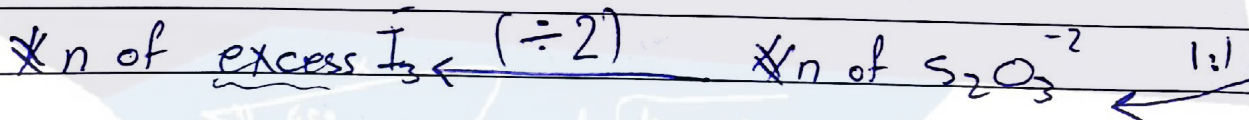
⊛ mass for sample



⊛  $*n$  of  $\text{Na}_2\text{S}_2\text{O}_3 = M * V(L)$

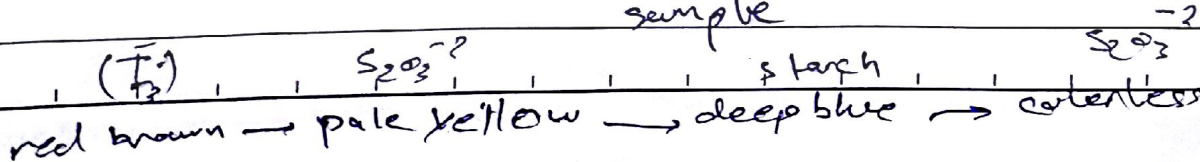
$\downarrow$

buret (F-I)



Mass percent

$$\frac{\text{mass}}{\text{sample}} \times 100\%$$



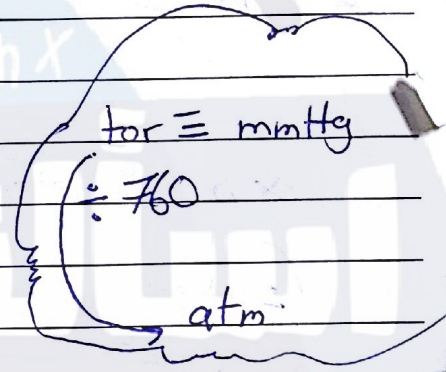


- a) gases behave ideally : ① low pressure  
 ② High Temp  
 ③ low MM

$$\rightarrow PV = nRT$$

$$\Rightarrow PV = \left( \frac{\text{Mass}}{\text{MM}} \right) * R * T$$

P: atm  
 V: L  
 Mass: g  
 T: K  
 MM: g/mole



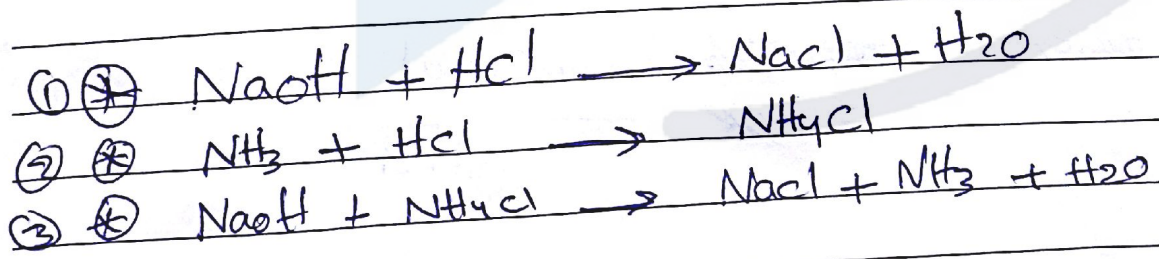
10)

Heat lost = Heat gained

$$q_{\text{warm water}} = [q_{\text{cold water}} + q_{\text{cal}}]$$

$$(m * S * \Delta t)_{\text{warm water}} = [(m S \Delta t)_{\text{cold}} + (C * \Delta t)_{\text{cal}}]$$

for cold water  
 ↓  
 cal constant





A)  $(q_{\text{lost}})$  Heat lost by hot water =  $m * S * \Delta T$

$(q_{\text{gain}})$  = ~~lost~~ <sup>gained</sup> = cold =  $m * S * \Delta T$

$(q_{\text{hot}})$  Heat gained by cold water = (lost - cold)

(C) constant =  $\frac{\text{Heat gained by cal water}}{\Delta T \text{ for cold water}}$

B)  $(q_{\text{sol}})$  Heat gained by solution =  $m * S * \Delta T$

$(q_{\text{cal}})$  = " = cal =  $C * \Delta T$

Heat of the reaction =  $-(q_{\text{sol}} + q_{\text{cal}})$

$\Delta H = \frac{\text{Heat of the reaction (kJ)}}{\text{No of water} \approx \text{NaOH} \text{ mol}}$

~~No of water~~  $\approx \text{NaOH} \text{ mol}$

\*  $V + V = 2V$

\*  $m + m = 2m$

c) same part (13)

\* to determined the third equation enthalpy



$\Delta H_{\text{Third}} = \Delta H_{\text{(First)}} + (-\Delta H_{\text{(Second)}})$

"Hess's law"