23/4/2025 التاريخ

الموضوع سكشن الكيمياء

«Physical chemistry»

عملي

* Analytical chemistry → deals with the identification of sample component and measure their actual Amount.

Analytical chemistry classified into Two Branches

Quantitative	Qualtitative
Deals with measuring the Actual Amount (weight, cone, volume).	Deals with the identfaetion of Sample Component.

Salt

* Neutralization Reaction

Acid + Base ⟶ Salt + H_2O

Ex: $H^+Cl^- + Na^+OH^- \longrightarrow Na^+Cl^- + H_2O$

Positive Ion ← «cation» — Negative Ion «Anion»

Basical radical — Acidic Redical

* classifaction of Acid based on it's stability:

1. dil HCl ⇒ 6 AR
2. cone H_2SO_4 ⇒ 4 AR (Cl^-, BY^-, I^-, NO_3^-)
3. $BaCl_2$ Solution ⇒ 3 AR

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Aeid radical أو الشق الحامضي ⇐ Ac !!

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* ⓑ Aeidic Radical :

[CO_3^{2-} , HCO_3^- , S^{2-} , SO_3^{2-} , $S_2O_3^{2-}$, NO_2^-]

أضعف الشقوق الحامضية

$Na_2CO_3 + HCl \longrightarrow NaCl + H_2CO_3 \leftarrow \begin{matrix} H_2O \\ CO_2 \end{matrix}$

$Na_2S + HCl \longrightarrow NaCl + H_2S$

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* Stability ⇒ $H_2CO_3 < HCl < H_2SO_4$

!! كل أنواع الكربونات تذوب في الماء ماعدا [صوديوم / بوتاسيوم / أمونيوم]

GP1 - dil Hcl

DY test ⇐ أنبوبة جافة تمامًا لأن حمض الكبريتيك نازع

main test ①

dil Hcl

DY test ← Small Amount Salt

* المخلوط يظهر تأثيرات من التجربة وكلن لأن CO_3 ، HCO_3 لهم تأثير واحد، لذلك يظهر مشاكل ولهذا نأخذ التجربة التأكيدية مع التجربة الأساسية.

* Conferm test :-

Solid Salt ← H_2O

white PPt on Cold (CO_3^{2-}) ↵ ↳ white PPt after Heating (HCO_3^-)

CO_3^{2-} , HCO_3^-

$MgSO_4$ ⇓ , $BaCl_2$, $AgNO_3$

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H_2O → Soild Salt → S^{2-} → $Pb(CH_3COO)_2$ / $AgNO_3$] Black PPt

EXP	OBS	RES
Soild Salt + dil Hcl	Effervence and evolution of CO_2 gas which trubid lime water due to formation of insoluble $CaCO_3$ $Na_2CO_3 + 2HCl \rightarrow 2NaCl + H_2O + CO_2\uparrow$ $NaHCO_3 + HCl \rightarrow NaCl + H_2O + CO_2\uparrow$ $Ca(OH)_2 + CO_2 \rightarrow CaCO_3\downarrow + H_2O$	AR Maybe CO_3^{2-} or HCO_3^-
Soild Salt + dil Hcl	Evolution of H_2S gas characterized by its rotton odor. blacking of Filter Paper moistened with lead acetate solution $Na_2S + 2HCl \rightarrow 2NaCl + H_2S\uparrow$ $H_2S + Pb(CH_3COO)_2 \rightarrow 2CH_3COOH + PbS\downarrow$	AR Maybe S^{2-}
Soild Salt + dil Hcl	Evolution of SO_2 gas characterized by its suffocating odor, which turns acidic Paper Moisten with $K_2Cr_2O_7$ into green $Na_2SO_3 + 2HCl \rightarrow 2NaCl + H_2O + SO_2\uparrow$ $3SO_2 + H_2SO_4 + K_2Cr_2O_7 \rightarrow K_2SO_4 + Cr_2(SO_4)_3 + H_2O$	AR Maybe SO_3^{2-}
	Evolution of SO_2 gas and Yellow P.P.t is Formed due to Separation of Sulpher $Na_2S_2O_3 + 2HCl \rightarrow 2NaCl + H_2O + SO_2\uparrow + S\downarrow$	AR Maybe $S_2O_3^{2-}$

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EXP	OBS	RES
Solid Salt + dil Hcl	Evolution of colorless gas (nitrous acid) which combines with oxygen of air and giving brown gas (nitrogen dioxide) at the mouth of test tube $NaNO_2 + HCl \rightarrow NaCl + HNO_2 \uparrow$ $3HNO_2 \rightarrow H_2O + HNO_3 + 2NO$ $2NO + O_2 \rightarrow 2NO_2$	AR Maybe NO_2^-
	-Ve	1 gp is absent