Chemistry Experiments to be written in Chemistry Practical File

Chemistry Practical File (Nova ICSE Chemistry-Lab Manual)

Students of Class X as per the requirement of CISCE (ICSE Board), have to make a Practical File in the Subject of Chemistry.

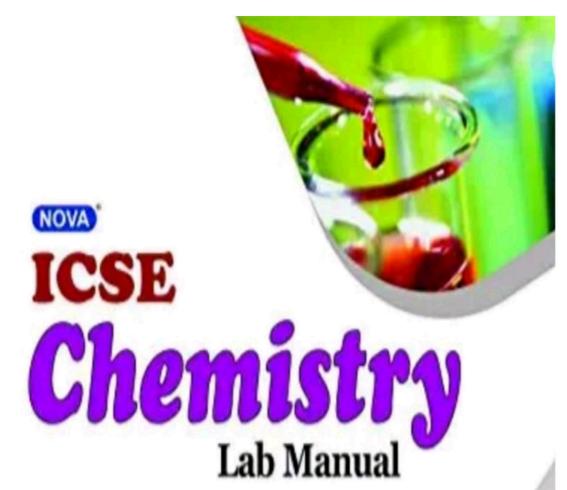
<u>Instructions to be followed for writing experiments:</u>

- 1. On the ruled lined pages: Write the experiment number (as given in the list of experiments to be performed for Session 2021-22); Aim of the experiment; Requirements, Procedure, Observations, Conclusions, Precautions (if any). All these details are described by the publisher (of the Practical File) in the beginning of the file.
- 2. On the blank pages: Draw the diagram/s or table (if any) related to the experiments. Make use of the pencil only for making the diagrams.
- 3. New experiment will start from a new page.
- 4. Do not use any other colour pen in the 'Practical File' except blue pen You may write headings using black pen.
- 5. For reference a sample 'Practical File' made by a student is being attached with

CHEMISTRY PRACTICALS - X

As per the guidelines from the Council (ICSE), the students of Class X are required to perform following experiments for the session 2021-22.

- **Expt-1.** To identify Ca²⁺ion in the given salt using NaOH and NH₄OH solution.
- **Expt-2.** To identify Zn²⁺ cation in the given salt solution using NaOH and NH₄OH solutions.
- **Expt-3.** To identify Pb²⁺ cation in the given salt using NaOH and NH₄OH solution.
- **Expt-4.** To identify Cu²⁺ cation in the given salt using NaOH and NH₄OH solution.
- **Expt-5.** To identify Fe²⁺ cation in the given salt using NaOH and NH₄OH solution.
- **Expt-6.** To identify Fe²⁺ cation in the given salt using NaOH and NH₄OH solution.
- **Expt-7.** To identify Fe³⁺ cation in the given salt using NaOH and NH₄OH solution.
- **Expt-8.** To identify the anions Cl⁻, NO₃⁻ and SO₄²⁻ present in the salt using conc. sulphuric acid.
- **Expt-9.** To study the effect of conc.HCl acid on metal oxide (CuO).
- **Expt-10.** To study the effect of conc.HCl acid on metal oxide (MnO₂).
- **Expt-11.** To determine acidic and basic nature of solution.





HOOTAN

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Aim: To Potentify Ca2+ cation in the given sold solution using NaOH, NHYOH

Apparatus: clean test tube , glass mad, desopper, testrube holder.

OBSERVATION TABLE

TEST	OBSERVATION	INFERENCE
To the salt solution add NaoH solution	A white precipitate is obtained.	Ca2+ on Pb2+ ion may be present
Add excess NaOH solution	unde forécépitale is insoluble	Ca2+Pon formed
To the solt Solution add NHyOH solution	no foreapitale is obtained	May be Ca2+
Add NHyOH Solution in excess	no precipitate is	Sa²+ ion form

Expt. No	Page No
Asia Sap	eriment -2
cuing NaOH & N	Zn2+ cotion in the given solt solution
	est tuke, glass evol, dropper, test
	15 to
Chemicals 3- Na DH	& NH40H solution.
Brocedurie -	
	of salt solution for its ration Eden
- tilication. Ald of	Sout 10 ml of distilled neater to the
salt and well t	o obtain the aqueous salt solution.
TOTAL TOTAL	and the state of t
Reactions	
With Naon ?-	*
	OH - JZn (OH) 2 V + 2 Na NO3
1.333	(white ppt)
Zn(OH)2+2Na0	H -> Na2 In O2 + H20
With NHUOH ?-	I total best lide 1 . B see that
,	(whiteppt)
	H -> [Xn (NH;)4](OH)2+4H20
HOOTAN	Teacher's Signature

APM? To identify 2n2 ration in the given with webstien wing ward L NHyOH solution.

Apprenalus o- clean test tuke, glass read, druffer, test-tuke

OBSERVATION TABLE

TEST	OBSERVATION	INFERENCE
To the soll sol.	gelotinous white ppt is	Zn²+ ion may be present.
Add Noot Lol.	while ppt dissolves	In2+ ion confirmed
To the given sall solution add NHyOH sol.	Gelatinous white bpt is obtained	Zn2+ ion may be present.
Add NHUOH Ed. in excess.	white foot dissolves.	Indtion confirmed.

xp	NoPage No
	1 4 8 24 14 14 1
	Experiment -3
	Alm? To identify the ration Pb2+ in the given sall.
	Color
	Apparotus - clean test tube, test tube holder, glass
	Chemicals: NaOH & NHyOH solution.
	Procedure - Take about 1-2 gm of the galt solution for
	Procedure - Take about 1-2 gm of the salt solution for its cation identification. Add about 10ml of distille runter to the satt and shake well to obtain the aqueou
	water to the satt and shake well to obtain the agree
_	salt solutions
	Reactions o-
_	With NOOH
	Pb(NO3)2+2NaOH -> Pb(OH)2V+2NaNO3
_	while
	Pb(OH)2 + 2NaOH -> Na2 PbO2 + & H2O
_	WILK NHUOH
	Pb(NO3)2 + 2NHyOH -> Pb(OH)2 + 2NHyNO3
	white ppt
	In soluble in
	excess
	NOOTAN Teacher's Signature

Aim? To identify Pb2+ solution in the given salt solution using (Na OH & NHyOH) solution.

Apparatus : Clean test tube a test tube halder, glass read, dropper

OBSERVATION TABLE

TEST	OBSERVATION	INFERENCE
To the salt solution add NaOH Add NaOH in excess.	White ppt is white ppt dissolves	La ²⁺ , Zn ²⁺ on Pb ²⁺ may be present Zn ²⁺ on Pb ²⁺ may Be Bresent
To the solt solution add NHyOH	white ppt is obtained	be present
Add NHyOH In excess	autorities scrinting	PB2+ confirmed

xpt. No	Page No
Experement -4	C > 5 7114
Almo- To identify Cu2+ cotion in the gir solution using NaOH and NHyOH solution	una dall
distution using Naph and NH. DH wall to	in sut
The state of the s	on.
Appropriate - clean tost tube days and -	took I to I to
Apparatus - clean test tube, glass evod,	ust tube holde
Старрот	
Chemicali ?- Na DH solution and NHyDH solu	ition
Porocedure o-	* FB Q1 21
Take about 1 to 2 gm of Sult solution	lose its nation
Adontification. Add about to 10ml of de	istilled waston
to the salt and shake ruell to obtain	Les saules
salt solution.	ing inglicous
2000072	1 12 113 37 30
Reactions	
With NaOH	curv / 15
LUSQ + 2NOOH -> CU (OH) 2 V + No 2 SOY	3 7 110 10 10
blue 1) to the 2 to t	
blue ppt.	
WITH NHUOH	1 601/2 31
Puco I anti-ou	
Cusay+2NH;OH -> Culonz + (NHy) 2 Soy	
blue ppt	
SULOH)2 + &NHyOH + (NHy)2 SO4 > [Lu (NH	3)4]504+
	44,0
(- 3) morres	
Teacher's Sig	nature

AIM? To identify Cu2+ cation in the gluen salt solution using Nable and NHyOH solution.

Apparatus ? Clean test rubes, glass sud, test tube holder,

OBSERVATION TABLE

TEST	OBSERVATION 10, 444	INFERENCE
To the saltsol.	Blue ppt is obtained	Su2+ may be present
Add NaoH in Excess.	ppt is insoluble	cu2+, confirmed
To the salt sol. add NH40H	Blue ppt is obtained	bresent
Add NHyOH in excess.	Blue ppt dissolves guing -gon ney blue sol. of the complex soll.	Lu2+ confirmed
		- HU, HM NEW

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Ex	realment -	5
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Almo- To identify Fe2+ ration in the given salt solution

Apparatus? Mean test tubes, glass rod stest tube holder, decopper

OBSERVATION TABLE 100

TEST	OBSERVATION	INFERENCE
Tathe salt sol. Add NaOH	Diedy green ppt is obtained o	fe ²⁺ may be present.
Add Walt in excess.	ppt 2 insoluble	Fert confirmed
To the salt sol. add NH40H	Disty green ppi is	fert may be in
Add NHUOH	ppt is insoluble	Fe2+ confirmed.
3013	- Color 12 30 11 20 5	

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Ain: To identify the cation Fest in the given east solution using NaOH and NHYOH solution is

Apparatus: - clean test tube, glass Rod, test tube holder, dropper

Observation Table :-

Experiment	Observation	Inference
To the salt solution add NaOH. Add NaOH in excess	Reddish brown ppt obtained ppt 10, msoluble	1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -
To the salt sol. add NHyDH	Reddish brown ppr 13 Obtained	Fe3+ may be present.
Add NHYDH	ppt is insoluble	Fe 3+ 10 confirmed

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Expt	t, No
	Experiment -7
	Aim 6
	To identify the anions $(0_3^2, 5^2 - $50_3^2)$ in the given salt using dilute H_2SO_4
	Apparatus:-
	clean test tube glass rod, test tube holder, spirit lamp.
	Spill Comp.
	Procedure :-
	Take about 1 to 2 gm of salt for anion identification
<u>II</u>	Add about 10ml of distillervates to the salt
	and shake well to obtain the aquous salt
	solution. The salt solution are then acted
11	upon by dilute H2SO4.
1	
	Reactions:-
1.	Carbonate ions -
	Na2 603 + dil H2SO4 -> Na2 SO4 + H20 + CO2
	CO2 + Ca (OH)2 -> Ca CO3 + H20
	Cime water white
2.	College Cont
70	THE WIPE
	Na2 SO3+ dil. H2 SO4 -> Na2 SO4+ H20+ SO2
	K2CR2O7+ H2SO4+3SO2-> CR2(SO4)3+K2SO4+H2O
	Woor in Frange (green) Teacher's Signature

Aim: - To identify the anions (03, 52, 503 in the given salt using dilute 12504.

Apparatus: - Clean test tube, glass rod, test tube holder, spirit lamp
Observation Table:-

EXPERIMENT	OBSERVATION	INFERENCE.
Given salt to dil Hzsoy	Gas is evolved with	Gas may be SOL or
Bring moist blue ditmus paper near gas Pass the gas through lime water	Blue litmus paper become sed in 19 Lime water turn in milky	Cozor Soz gas' Cozor Soz gas' Cozor Soz gas'
Bring filter Paper Clipped in acidified KMnoy or K2Cr207 1 near the gas	No effect on the filter paper	Co2 gas confirmed Co32 lon in the salt

EXPERIMENT	OBSERVATION	INFERENCE	
Given Salt + dilute 12504	Gas with suffocating smell of burning sulpher is evolved	Gas may be soz	
Bring fitter paper dipped in acidifed K2Cr207 near the gas	Orange Coloured paper tun green	Gas 12 SO2. So3 ² -ion confirmed	

Expt.	NoPage No
	2 KMn0y + 2H2O + 5SO2 > K2SOY + 2MnSOY + 2H2SOY
	(Colouriess)
	- 10 10 10 10 10 10 10 10 10 10 10 10 10
9.	Sulphude lons -
	Na25+ dil- H2504 -> Na2804+ H251
	/ Rotten egg smell)
_	(CH3C00) Pb+ H25 -> Pbs + CH3C004
_	(black)
4	
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EXPERIMENT	OBSERVATION	INFERENCE
Bring filter paper dipped in acidified Kmoy near the gas	Pink coloured paper tun colourless	
Given Salt + dil H2504	Agas is evolved with smell of rotten eggs	H2S gas may be present
Bring moist blue litmus paper near	Blue litmus becomed Red	
The gas	Linuguo et Liale Le ep a literale	tando do la
Bring lead acetate	Lead acetate paper	
paper near the gas	become black to	lon Confirmed

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Exp	Page No
	Experiment -8
	Aim :-
	To identify the anion ce, No3 and Sog prevent
	in the salt Using conc. sulphuric acid
	Apparatus:-
	Clean test tubes, glass rod, test tube holder,
	spirit lamp.
	Chemicals :-
	Mnoz, conc. H2SO4, ammonia Solution, AgNO3,
	dil HNO3
	Procedure:
	Ct and Noz are acted upon by conc. H2Soy.
	Chemical Reactions involved in the reaction of:-
10	Chloride Jons -
	Nacl + H2SOY -> NaHSOY+ HCE
	HCl + NHy -> NHyCl
	(d'ense while fumes)
	Nacl + AgNO3 -> Agcl + NaNO3
	(white ppt)
	AgCe + NHYOH -> EAG (NH3) JCE
	Poteo
	Teacher's Signature

Aim: - To identify the anion Cl, NO3 and Soy present

Apparatus: - Clean test tube, glass rod, test tube holder, spirit lamp

Obstivation Table:-		
EXPERIMENT	OBSERVATION	INFERENCE
Given Solution + Conc. H2Soy	Colourless gas with pungent	cl may be prepared
Wet blue litmus paper	Become Red	cé may be present
Glass had dipped in NH40H & bring it on mouth of test tube	Dense white firmes of NHyCl are formed	ct ion present
Given salt + AgNO3	Curdy white ppt	contain CE
Add NHYOH to the above ppt	curdy white ppt dissolves	Ce ion confirmed

EXPERIMENT	OBSERVATION	INFERENCE.
Given 2alt + Conc. H2SO4	Brown firmes with irritating ordous	Nozgas may be present
Add cu turing to the	Evolution of brown fumes intensified	No2 gas confirmed

1. NO	Page No
	* FIR 31
Nitrate ions:-	
Na Nost Conc. +	42504 -> Natisoy + HNO3
Cu + 4 HNO3	-> Cu (NO3)2 + 2HO+ 2NO2
8 2	47.00 1.00 1.00 1.00
Ring test :-	
2 HNO3+ FeSOY + H2S	04 -> Fe (SO4)3+ H20+2NO
Fesou + NO	-> [FeSoy·NO]
	nitroso perrous sulphate
b	
44. 145.	

a a a a a a a a a a a a a a a a a a a		
EXPERIMENT	OBSERVATION	INFERENCE
Given salt solution + frestrly prepared FeSOy + conc. H2SOy along	A brown ring is formed at the junction of two layer	Presence of No3
the side of test tube		
EXPERIMENT	OBSERVATION	INFERENCE.
	White ppt 1s formed	Soy may present
To above ppt add	White ppt dissolves	Soy²-gas may present
C13C00 117	्यार ययंत्रा १ मध्य हेव	20v 000 000
Given salt solution	white ppt appear	
+ BaClz no many	274 di Fragaini 340	
Add HCI to above	White ppt 12 involuble	- 1000E Day 1/2

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Aim: To study the effect of conc. Hel acid

Apparatus: - Clean test tube, test tube holder, glass rod, spirit lamp.

Chemicals: - Cuo, conc. HCl, NHYOH Solution, NaOH Solution, Starch iodide paper

Procedure: - Cupric oxide oxidises conc. Hele to evolve chlorine gas and Itself is reduced to cupurous chloride when conc. Hele is added to cup es gas is evolved and a green solution is formed in the test tube which turn blue on dilution

2 CUD +4HCl -> C42C12 +2H2O+C62

Cu2 Cl2+ Cl2+HCl -> CuCl4+4H+

Cully + H+ dilution Cully + HCl

CuCl2+ 2NHyOH -> Cu(OH)2+2NHyCl

Aim: - To study the effect of conc. Hel and on metal oxide (Cuo)

Apparatus: - Clean test tubes, test tube holder, glass rodg spirit lamp

Observation table:-

Experiment	Observation	Inference
Heat the substance and conc. He	Greenish yellow gas	The gas may be C/2
	- 10 - = [Fe- 29]	-p-2157
	Colour is bleached	
Pass the gas over starch isolide test tube	Dark blue colouration	Chloride gas is
Solution of the substance + NHYOH in excess	Blue ppt which observes in excess giving inky blue solution	Solution contains Cu ²⁺ con
Heat the ppt	Twns	Cu2+ confirmed

s microsocietados

Aim: To study the effect of conc. Hel on metal oxide(mo)

Apparatus: - Clean test tubes, test tube holder, glass

Chemicals: - Mno2 , conc. HCI, NHYOH, NAOH, Starch iodide paper.

Procedure: - When concentrated hydrochloric acid is added to manganese dioxide and mischure is heated. Chlorine gas is evolved and light pink solution of mangemese Chloride (mncl.) is formed in the test tube

MnO2+ HCl -> MnCl2+2H2O+Cl2(g)

(black powder) (light pink) (greenish yellow)

MnC12 + NaOH -> Mn(OH)2 + NaCI

 $2mn(OH)_2 + O_2 - > mnO(OH)_2$ (Brown)

Aim: - To study the effect of conc. Hill on metal oxide (MMO2)

Apparatus: - Clean test tube, test tube holder, glass rode, spirit lamp.

Obsulvation Table :-

Experiment	Observation	Inference
Heat the substance and conc. HCI	Greenish yellow gas	C12 may be present
Pars the gaseous red rose petal Pars the gas over starch Codide paper	Dark slue colouration	1. C/2 gas is in
Solution of substance + NaOH slowly in excus	ppt is formed which become brown when a exposed to air	Solution contains Mu ²⁺ con
Substance + conc. HCI	Light pink solution is obtained	Mn2+ Confirmed

Teacher's Signature __

Aim: - To determine acidic and basic nature of solution

Apparatus: - Clean test tubes, test tube holder

Observation table Experiment			Inference	
Test with .	So/A	SolB.	Chemicalis := no is d'iste p	
Blue litmus paper		Red	Solo B is acidic	
Red litmus paper	Red become blue	No change in Colour	Sol-A 10 Basic	
Ton 124 years) <u>() () () () () () () () () (</u>	gas which truns lime water milky	Sol-B 12 acidic Gas - 10 °Co2	
Solid NHyCI	A colourless gas with pungent Smell	Acolowless gas with Chacking Smell	sol- Ais Basic an	
	produces white fumes with concetical	، با ب	Sol B is acidic and gas is HCI	