

पु⊍ना International School

Shree Swaminarayan Gurukul, Zundal

Class – XII Subject: Chemistry(Practical) Experiment (2020_21)

Exp. No	Aim
	QUANTITATIVE ANALYSIS
1	Prepare 250 ml of 0.1MSolution of Oxalic Acid From Crystalline Oxalic Acid
2	Determination of Concentration/Molarity of KMnO4 Solution by Titrating it against a 0.1M Standard Solution of Oxalic acid
3	Determination of Concentration/Molarity of KMnO4 Solution by Titrating it against a Standard Solution of Ferrous ammonium sulphate QUALITATIVE ANALYSIS
4	To Identify the given inorganic salt [Ba(NO3)2]
5	To Identify the given inorganic salt [Pb(CH3COO)2]
6	To Identify the given inorganic salt [Pb(NO3)2]
7	To Identify the given inorganic salt PbCl2
8	To Identify the given inorganic salt MgSO4
9	To Identify the given inorganic salt ZnCl2
10	To Identify the given inorganic salt ZnSO4
11	To Identify the given inorganic salt [(NH4)3PO4]
12	To Identify the given inorganic salt NH4Br
13	To Identify the given inorganic salt [(NH4)2CO3]
14	To Identify the given inorganic salt [Sr(NO3)2]

	ORGANIC COMPOUNDS
15	To Identify functional group of Aldehyde (-CHO)
16	To Identify functional group of Ketone (-CO-)
17	To Identify functional group of Alcohol (-OH)
18	To Identify functional group of Carboxylic acid (-COOH)

EXPERIMENT 11.1



Prepare 250 ml of 0.1 M solution of oxalic acid from crystalline oxalic acid.

THEORY

Molecular mass of crystalline oxalic acid
$$\begin{pmatrix} COOH \\ | & .2H_2O \\ COOH \end{pmatrix} = 126$$

Hence, for preparing 1000 ml of 1M oxalic acid, weight of oxalic acid crystals required = 126 g

∴ For preparing 250 ml of 0.1M solution,

oxalic acid crystals required =
$$\frac{126}{1000} \times 250 \times 0.1 = 3.150$$
 g.

APPARATUS

Watch glass, analytical balance, weight box, fractional weight box, 250 ml beaker, glass rod, 250 ml measuring flask and wash bottle.

CHEMICALS REQUIRED

Oxalic acid crystals and distilled water.

PROCEDURE

- 1. Take a watch glass, wash it with distilled water and then dry it.
- 2. Weigh the clean and dried watch glass accurately and record its weight in the notebook.
- Weigh 3.150 g oxalic acid on the watch glass accurately and record this weight in the notebook.
- 4. Transfer gently and carefully the oxalic acid from the watch glass into a clean 250 ml measuring flask using a funnel. Wash the watch glass with distilled water with the help of a wash bottle to transfer the particles sticking to it into the funnel [Fig. 11.14]. The volume of distilled water for this purpose should not be more than 50 ml.
- 5. Finally wash the funnel well with distilled water with the help of a wash bottle to transfer the solution sticking to the funnel into the measuring flask [Fig. 11.15].
- Swirl the measuring flask till solid oxalic acid dissolves.
- Add enough distilled water to the measuring flask carefully, upto just below the etched mark on it, with the help of a wash bottle.

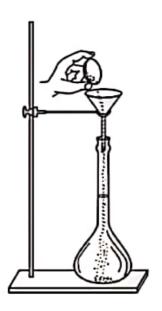


Fig. 11.14. Transferring oxalic acid to the flask.

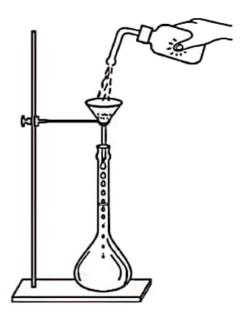


Fig. 11.15. Adding water.

- 8. Add the last few drops of distilled water with a pipette or a dropper until the lower level of the meniscus just touches the mark on the measuring flask [Fig. 11.16].
- 9. Stopper the measuring flask and shake gently to make the solution uniform throughout. Label it as 0.1 M oxalic acid solution [Fig. 11.17].

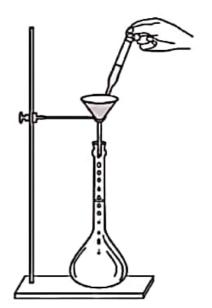


Fig. 11.16. Adding last small amount of water dropwise.

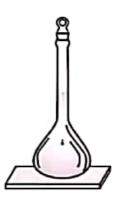


Fig. 11.17. Standard solution of oxalic acid.

EXPERIMENT 6.1

Aim

To determine the concentration/molarity of $\rm KMnO_4$ solution by titrating it against a 0.1 M standard solution of oxalic acid.

Reactions of oxalic acid

A. Chemical equations

Reduction half reaction: $2KMnO_4 + 3H_2SO_4 \longrightarrow K_2SO_4 + 2MnSO_4 + 3H_2O + 5|O|$

Oxidation half reaction: $H_2C_3O_4 + |O| \xrightarrow{sorc} 2CO_3 + H_2O| \times 5$

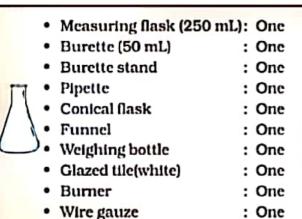
B. Ionic equation

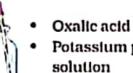
Reduction half reaction: MnO₄ + 5e⁻ + 8H⁴ --- Mn²⁺ + 4H₄O| × 2

Oxidation half reaction : $C_2O_4^- \longrightarrow 2CO_2 + 2c^-| \times 5$

 $2 \text{ MnO}_{4}^{-} + 5 \text{C}_{2} \text{O}_{4}^{2-} + 16 \text{H}^{2} \longrightarrow 2 \text{Mn}^{2-} + 10 \text{CO}_{2} + 8 \text{H}_{2} \text{O}$

Material Required





Oxalic acid : As per need

Potassium permanganate

solution : As per need

• 1.0 M Sulphuric acid : As per need

Procedure

: One

A. Preparation of 0.1 M standard solution of oxalic acid

Prepare 0.1M oxalic acid solution as mentioned in experiment 2.1(Unit 2, Class XI, Laboratory Manual)

B. Titration of oxalic acid solution against potassium permanganate solution

- (i) Rinse and fill a clean burette with potassium permanganate solution. Remove the air bubble, if any, from the nozzle of the burette by releasing some solution through it. The burette used in the permanganate titration must have a glass stop cock as rubber is attacked by permanganate ions.
- (ii) Take 10 mL of 0.1 M oxalic acid solution in a conical flask and add half of the test tube full (= 5 mL) of 1.0 M H₂SO₄ to it to prevent the formation of any precipitate of manganese dioxide during the course of the titration.
- (iii) Heat the oxalic acid solution upto 50°-60°C before titrating it with potassium permanganate solution taken in the burette. To increase the visibility of the colour change, place the conical flask containing the solution to be titrated over a white glazed tile kept below the nozzle of the vertically fitted burette.
- (iv) Note the initial reading of the volume of permanganate solution in the burette and add it in small volumes to the hot oxalic acid solution while swirling the contents of the flask gently. The violet colour of permanganate solution is





Chemical balance









Sulphurte actd

discharged on reaction with oxalic acid. The end point is indicated by the appearance of permanent light pink colour due to a slight excess of permanganate solution.

- (v) Repeat the titration till three concordant readings are obtained. Since the solution of KMnO₄ is of dark colour, the upper meniscus should be considered for noting the burette readings.
- (vi) Record the readings as shown in observation Table 6.1 and calculate the strength of potassium permanganate solution in mols/litre.

Table 6.1: Titration of potassium permanganate solution against standard oxalic acid solution

Sl. No.	Volume of Oxalic acid in mL	Burette readings		Volume (V) of
		Initial (x)	Final (y)	V = (y-x) mL
		, Q	-	
		1 50	1.70	
		1	0	
			7	
	6			

Calculations

6/10

 The strength of the unknown solution in terms of molarity may be determined by the following equation.

$$a_1 M_1 V_1 = a_2 M_2 V_2$$

(6.1)

For oxalle acid vs potassium permanganate titration:

- a₁ = 2. (the number of electrons lost per formula unit of oxalic acid in a balanced equation of half cell reaction)
- a₂ = 5. (the number of electrons gained per formula unit of potassium permanganate in the balanced equation of half cell reaction)

 M_1 and M_2 are the molarities of oxalic acid and potassium permanganate solutions used in the titration.

 V_1 and V_2 are the volumes of oxalic acid and potassium permanganate solutions.

On putting the value of a_1 and a_2 in equation 6.1 we get

Oxalic acid
$$KMnO_4$$

 $2M_1V_1 = 5M_2V_2$

$$M_2 = \frac{2}{5}\frac{M_1V_1}{V_2}$$
(6.2)

We can calculate the molarity of potassium permanganate solution by using equation 6.2. Strength of the solution is given by the following equation:

Strength = Molarity × Molar mass

Result

- (i) Molarity of KMnO₄ solution is _____.
- (ii) Strength of KMnO, solution is _____

Precautions

- (a) Always rinse the burette and the pipette with the solutions to be taken in them.
- (b) Never rinse the conical flask with the experimental solutions.
- (c) Remove the air gaps if any, from the burette.
- (d) Never forget to remove the funnel from the burette before noting the initial reading of the burette.
- (e) No drop of the liquid should hang at the tip of the burette at the end point and while noting reading.
- (f) Always read the upper meniscus for recording the burette reading in the case of all coloured solutions.
- (g) Never use pipette and burette with a broken nozzle.
- (h) Lower end of the pipette should always remain dipped in the liquid while sucking the liquid.
- (i) Do not blow out the last drop of the solution from the jet end of the pig. 7/10
- (j) The strength of the solution must be calculated up to the fourth decin
- (k) Do not forget to heat the mixture of oxalic acid and H₂SO₄ solutions between 50 while titrating it against potassium permanganate.

EXPERIMENT 6.2

Aim

To determine the concentration/molarity of KMnO₄ solution by titrating it against standard solution of ferrous ammonium sulphate.

Theory

Like oxalic acid, ferrous ammonium sulphate also acts as a reducing agent in the titration against potassium permanganate. The reaction which takes place is given below:

(a) Chemical equation

Reduction half reaction: $2 \text{ KMnO}_4 + 3 \text{H}_2 \text{SO}_4 \longrightarrow \text{K}_2 \text{SO}_4 + 2 \text{ MnSO}_4 + 3 \text{H}_2 \text{O} + 5 \text{ [O]}$

Oxidation half reaction :2 FeSO₄ (NH₄)₂ SO₄ . 6H₂O + H₂SO₄ + [O] \longrightarrow Fe₂ (SO₄) ₃ + 2 (NH₄)₂ SO₄ + 13 H₂O] x 5

 $2KMnO_4 + 8H_2SO_4 + 10FeSO_4 (NH_4)_2 SO_4 \cdot 6H_2O \longrightarrow K_2SO_4 + 2MnSO_4 + 5Fe_2(SO_4)_3 + 10(NH_4)_2SO_4 + 68H_2O$

(b) Ionic equation

Reduction half reaction: $MnO_4^- + 5e^- + 8H^* \longrightarrow Mn^{2*} + 4H_2O$

Oxidation half reaction: $Fe^{2^*} \longrightarrow Fe^{3^*} + e^- \times 5$

 $MnO_4^- + 5Fe^{2^*} + 8H^* \longrightarrow Mn^{2^*} + 5Fe^{3^*} + 4H_2O$

Material Required

Measuring flask (250 mL) : One

Burette (50 mL) : One

Burette stand : OnePipette : One

Conical flask : One

Glazed tile (white) : One

• Funnel : One

Weighing bottle : One



permanganate solution: As per need
Dilute sulphuric acid: As per need

Ferrous ammonium

sulphate : As per need

Procedure

A. Preparation of 0.05 M, standard solution of ferrous ammonium sulphate

(Molar mass of FcSO₄(NH₄)₂SO₄. $6H_2O = 392 \text{ g mol}^{-1}$).

- (i) Weigh 4.9000 g of ferrous ammonium sulphate and transfer it into a 250 mL measuring flask through a funnel.
- (ii) Transfer the solid sticking to the funnel with the help of distilled water into the flask and add dilute H₂SO₄ into the flask drop wise to get the clear solution.
- (iii) Shake the flask till the substance dissolves and make the solution upto the mark.

B. Titration of ferrous ammonium sulphate against potassium permanganate solution

- (i) Rinse and fill the clean burette with potassium permanganate solution. Remove air bubbles if any, from the burette tip by releasing some solution through it.
- (ii) Take 10 mL of 0.05 M ferrous ammonium sulphate solution in a conical flask and add half test tube (≈ 5 mL) full of (1.0 M) H₂SO₂ to it.
- (iii) Titrate the above solution with potassium permanganate solution till the colour of the solution changes to permanent pink. Swirl the content of the flask during the titration.
- (iv) Repeat the titration, until three concordant readings are obtained.
- (v) Record the readings as shown in observation Table 6.2 and calculate the strength of potassium permanganate solution in mols/litre.











Table 6.2: Titration of potassium permanganate solution against standard ferrous ammonium sulphate solution

Sl. No.	Volume of ferrous ammonium sulphate	I Duitte Reading		Volume (V) of
	solution used for each titration in mL	Initial (x)	Final (y)	KMnO ₄ used V = (y-x) mL
				. 1

Calculations

The strength of unknown solution in terms of molarity may be determined by the following equation:

$$a_1 M_1 V_1 = a_2 M_2 V_2$$

 M_1 and M_2 are the molarities of ferrous ammonium sulphate and potassium permanganate solutions and V_1 and V_2 are volumes of ferrous ammonium sulphate and potassium permanganate solutions, respectively.

 $a_1 = 1$, (the number of electrons lost per formula unit of ferrous ammonium sulphate in the half cell reaction)

 $a_2 = 5$, (the number of electrons gained per formula unit of potassium permanganate in a half cell reaction)

Strength can be calculated by the formula given below:

Strength = Molarity Molar mass

Result

The strength of the given potassium permanganate solution is ____ g/L.

Precautions

- (a) Always use a fresh sample of ferrous ammonium sulphate to prepare its standard solution.
- (b) Other precautions are same as that in Experiment 6.1.

Expt. No.	5		Page No	
AIM :			Date	
	h h	EXPERIMENT-5		
Tra	AIM- To Polomthy	the given in organic S	alt [Ba (NO3)2]	
	EXPERIMENT	OBSERVATIONS	INFERENCE	
*	PRIMARY TEST			
1.	Colon.	white	Absence of Cu2+, Fe3+ (0,	
2	Smell	No specific	NH 52, CH3 coo absent	
3.	Cras Evolved	A neddish brown gas	No may be present.	
15/1/1		Fesoy son black.		
4.		No Sublimantion	NHit, I may be absent	
5.	Descreptation	No decrepitation	(Pb(NO3)2], Nall, KB2	
6.	Residue	white	Zn2+, Pb2+ may be absent.	
7.	FLAME TEST -			
4	Pareporo a poste Salt + Conc. HCl	Pensistent grassy groom Flame on prolonged	Bat2 may be possent.	
	- 2	healting.	2. 2	
8.	Salt + dil H2Sa,	No gas evalues	Cozi, si, NOz may be absent	
q.	Salt + dil H2504	Pink color of KMMO4 is	U, Br, I, C204, Fe2+	
	adding drops of	lost	may be absent	
10.	Heat a princh of salt and come.	No ammonia gas evolved	NH4 Obsemt	
	Naon		D 4 0 0	

The second of th		Date
Shake a Sall+	som oblained	label it as the original solution.
To a past of (0.5) add 1-2 ml of dil.	No ppt formed	C.I. Absemt (Pb2+ absemt).
To a part of sor pass	No ppt formed	GII Absent.
	No ppt formed	(Pb2+ Gu2+ Ag3+ absent) GIT absent (Fe2+, Al3+, absent)
a few drops NHLOH		
Thorough a pant of this som, pass 425	No ppt furmod	(2m2+, Mm2+, N;2+, Co2+
ammonical solutions	white ppt formed	obsent). GV present (Ca2+, Ba2+, Sr2+may be present).
Canbonate -		
CONFIRMATORY		
For Nitrate -		
heated a pinch off	Readish Bnown Gas	Nog Conformed.
H2SQ4.		
	Water mix To a part of (0.5) add 1-2 ml of dil. NUL To a part of sor pass H25 gas. To remaining sor add solid NH, U, Boil, Cool down, add a few drops NH, OH Through a part of this sor pass H25 gas. To the remaining ammonical solution, add the solution of the s	Pereparation of (05) Sol obtained Shake a Salt + Water mix To a part of (05) No ppt formed add 1-2 ml of dil. NO To a part of Sol pass No ppt formed Hose gas. To examising sol No ppt formed add Solid Nin, U. Boil, cool down, odd a few drops Nit, Ut Through a part of No ppt formed Alis sol pass Hos gas. To the examising white ppt formed ammonical solution add ammonium Corbonal C. Co Confirmatory TEST For Nitrate - Copper chips test, Readish Cown Gas heated a planch off the salt with cont. Hose Hos

Expt. No			Page No. 12
AIM:			
ь)	Ring Ted	Dork Brown ring is	NOz (on finmed.
18.	For Ba2+ -		
	Potassium Charomate test	Yellow ppt	Ba2+ Confirmed
<i>p</i>)	Penform flame test with salt	Grassy green flame	Ba ²⁺ Conformed
	RESULT- Acid Radical - Basic Radical -	3	
NV.	PRECAUTIONS -		
i	Handle neagen	its proposty	
i	Neven heat	wel test-tube	
ili N	Keep brocessing	y test-tube away from I	body.
N	Dom't imhale	moment boscomons dore	· § .
		al al	
Tall 5	-		
of the state of			
1		1-41/8	
and the same of th			

AIM :		EXPERIMENT - 6		
	AIM- To identify the given inorganic Salt [Pb (CH3 (00)2]			
	EXPERIMENT	OBSERVATION	INFERENCE	
*	PRIMARY TEST-			
	Coloum	white	shows absence of Cu2+, Mi2+,	
2.	Smell	Vinegan like smell	shows presence of CH3000-	
3.	Demsity	Vinegar like smell heavy.	Salt of Pb2+ on Ba2+ Combunate	
Ч.	Diliquescence	No deliquescence	Shows absence of zn(No3) 2 2 (lof zn12, Mg12 etc.	
1				
*	DRY HEATING TE	ST	*	
f.	Gas evolved	Characteristic svinegar	CH3 coo may be present	
		like smell		
6.	Sublimate Formed	No Sublimation	NHy & I one absent	
٦.	Descrepitation.	No descrepitation	Salts like Pb(NO3)2,	
			Nall, KI are absent	
8.	Respono.	white salt becomes black	CH3 COO may be present.	
		0		
*	FLAME TEST -			
9.	Make a poste of	Dull bluish white flame	Pb2+ may be present.	
A LEGAL CO.	salt and conc	i .	<u> </u>	
TOWN NO.	HCl 2 peorpo			
vision	perform the test		12 13 14 15 16 17 18	
VISION			Teacher's Signature :	

Expt. No.			Date
AIM :			
10.	Dil H2 Soy test: Toreat a pinch of Soll with dil.	No gas evolved	Co3-, 62-, No2 . So3- may be absent.
11.	KMmoy Test:		
	To a pinch of salt add dil Hosoy & heat Them add KMM	Pink colon of Komoy wasn't dischanged	Cr. Br., I. C204, Fe2+ may be absent:
12.	Heat a pench of Salt with Conc.	No commonsa gasis evolved	NHu+ absent.
13.	Proposition of (0.5.): Shake mix	Salution is obtained	label it as the oniginal
14.		white ppt is obtained	· Graup I is present. · Pb2+ might be present.
William Control of the Control of th	RESULT - ")	Acid Radical: CH3coo- Basic Radical: Po2+	
1820	PRECAUTIONS - i	Don't heat wet test tube Don't inhale gases, they Keep test-tube for from	might be poisomous
		i) Keep test-tube tan thom ii) Hamolla reagents cone	fully.
1			
in the same			

AIM:	EXPERIMENT - 7.				
	AIM - To relemb	AIM - To Edentify the given inosigamic Salt Pb(NO3)2			
	EXPERIMENT	OBSERVATION	INFERENCE		
*	PRIMARY TEST -				
1.	Colon.	white.	Shows absence of		
2	Smell	No specific odoun	Shows absence of Cu2+, Nit		
3.	Oonsity.	Heavy / Thick.	Salt of Ph2+ on Ba2 combonate.		
Ч-	Delique scence	No deliquescence	Shows absonce of Zm(NO)2, Chlonicles of Zm21, Mg21 etc.		
×	DRY HEATING T	FST -			
101	Gas Evalued	A sieddish Brown gas. evolved which turned Feson	No3 may be present.		
	C 118 10 T 0	Solution, black.	Charac alcomes of west or		
7.	Sublimate Formed Descriebitation.	No Sublimation. The Salt descriptiales	PO(NO)2, Nall, KB2 may be		
8.	Swelling.	No Swelling.	Shows absence of indicated.		
٩.	Residue	Hot → Bnown.	Pb2+ unight be priesent.		

Expt. 100.			Date
AIM	FLAME TEST	The state of the s	
10	Brepara a paste of	Dull Huish - white flame	bb2+ Pb2+ may be present.
	Salt 9 with concentration		
11 186	ted Hill and perform		
	flarmo Test.		
11	Dil Hosoy test:	No gas evolved	Pb2+ may be present.
9 :-	Treat a pinch of sult		,
	with dil Hason &.		
	heat.		
12.	KMmoy Test:		
ESI	To a pinch of salt	Pink colos of KMMDy was	U. Br. I, C202 Fe2 may
	add dil Hosoy (hot)	not discharged.	be absent.
	and them add a doub	•	
	of kmnoy		
13.	Comc. H2504 Test:	A reddish brown gas evolved,	Not may be present.
TRIL	Salt + Conc. 42504 +	which turned Fesoy som into	U I
1	(Heat if required)	black.	
14 -	Confirmatory Test.		
	FOR NITRATE -		
0)	'Cu' chip test; Heat a	Reddish brown gas evolves	Not is confirmed
3816	small quantity of		2KN02+ H2504
521	Salt with conc. Hosa,		K2504+2HND2
	and a few 'Cu' Chips		.
6)	Ring Test - 2-3-ml of	Solution obtained of	label it as original som.
	Salt Solm+ Fesouson	dark brown color, 2 liquide	
14	Add Conc. 42504 along	at the function.	- 49
	sides of test tube.		
15.	Preparation of	Solution obtained	label it as original sol
1283	(0.5)		V
Contract of	Shake a pinch of Salt with water.		
vision	Salt with water.	, , , , , , , , , , , , , , , , , , , ,	Teacher's Signature :

AIM				
16.	To a pinch of	white ppt is foormed	Good I: Pb2+ may be	
200	0.5, add 1.2 ml		present	
	of DII. HCR			
13.	Confirmatory test			
L /,	from by Pb dissolve			
	white ppt with			
	distilled water &			
	divide It in two			
	Prods.			
(0	KI Test: To one	Yellow ppt obtained	Pb2+ is confirmed	
10	Point and KI		Phologo 2KT -> Photogo 2KO	
	Solution.			
(d		Yellow ppt oblained	Pb2t is configurated	
1	to one post add		POUL2+ K2004 -> POCOU+	
	Kacrou solm		2KQ.	
	RESULT-			
The same	Acid Radical: N	0,5		
1	Basic Radical: P			
4	DUSIC IMEDICAL.			
	PRECAUTIONS -			
•)	Don't heat a wet test tube.			
2)	Don't inhale gases directly they might be hon mful			
3)	Keep test tube away from face while dry heating.			
	Handle man	Handle reagonts corefully.		
4)	numax reagent	continuity.		
OSIA I			Area .	
1				

AIM	AIM- To identify the given inorganic salt Pb(02)		
	EXPERIMENT	ÓBSERVATION	INFERENCE
*	PRIMARY TEST-		
1	Coloum	white	Shows absence of (12+, N12) Fe2+, Fe3+ M2+, 602+
2.	Smell	No spedfic smell	Shows absence of NH4,
3	Demsity	Heavy	Salt of Pb2+ on Ba2+ Conbonate may be present.
ч.	Deliquosceme.	no deliquescene	Shows absence of $2m(NO_3)_2$ & chlorides of $2m^{24}$.
*	DRY HEATING		
5	Coas Enolned	Colourless gas with pungeral smell, white furnes with-	
6.	Descreption.	No description	Pb(NO3)2, Nacl are absent
7.	Residue.	Hot -> Brown.	bb Pb2+ might be prosent.

AIM:			
	FLAME TEST-		
8		Dull bluish white flame.	Pb2+ may be proceent.
9.	Salt + Conc. HIO.	No 222 - 1 - 0	(032-, 52-, NO2-, 503-may
	Dil Hasoy Test. Theat a pinch of	No gas enolved	la second
	Salt with dil 11,50,		be present.
TREE	and heat		
10.	Come Hassy +	Colouralors are surranged small	O may be present.
1 2 3 6 7	Salt + Heat	Coloumless gas, pungent smell, white fumes with ammonia.	Coming or partition
PAHER A	(१३०६५७७५३)	and white Agnoz ppt.	
11-	Heat a pinch	No ammonic gas evolved	MH. I abcent.
	of salt with	100	19.114
A BURNEY	Com (· NaoH		
12.	Preparation(05)	Solution obtained	label it as the perigenal
	of: Shaking a mix		Soft.
	of Sall and water		
13	1	1	Goroup I is procent Pb2+may
E WAR	add 12ml of	obtained	be present.
	31. HQ.		
14.	Heat a pinch of	No NH3 gas is released	Absence of NHyt ions.
	solt with conc		
10 10 10 10 10	NaOH.		
	RESULT -		
	Acid Radical - (0-	
1	Basic Radical -	Pb21	4
	A		

		Date
AIM	PRECAUTIONS -	
	1 Neven Shoot wel test-tube	
i i	No direct impolation of cases.	
11	keep tube away tram foca . Life A 1	
i	Hamale suagents carefully	
-		

ЕЧ			
AIM	mem and Kmon		
The state of the s	+ Heat (18 nogulared)	No gas evolved	Ur, Bor, Tr, Nog, (Hgloo
11:	Heat a pinch of Salt with come.	No ammonia gas	NHy absent.
	Nao H	evolvecl	
12	Shake a mix of	Solution obtained	label as original
	Salt with water.		Solution.
13.	To a part of os	Domed 199 an	absent.
	dil HQ		
	Thorough the above formed solution.	Bounced 199 ON	Concup II absent CPb1', Cu2+, As2+, etc.)
ido.	Pass H25 gas		C . T al
16.	To rumaining som	No ppt framed.	(Fe21 A13+ absent)
	add a pinch of solid		Creat, HI , absence
	NHyll, Boil the Soil		
44,	and add excess NHLOH	No ppt formed	Group V absent
	To the romaining	No ppr 1031 Mg C	(cat, Ba21 absent).
	Carbonate.		
17.	Thorough a paint	No ppt formed	(nenoup T) absent
自进入	of the above		(2m2+ Mm2+, N;2+, Co2+
	Som. pass 425 gas		absent)
	RESULT-		
	Acid Radical - Soy	2-	
	Basic Radical - M	192+	
			1) 14 13 12 12
sion	2 3	,	Teacher's Signature

Expt. No.	Page No. 23
AIM :	PRECAUTIONS
() ii) ii) io>	Don't heat wet test-tube Don't inhale amy gases. Keep tube away from face while heating day. Handle reagon's corotuly.

AIM:	EXPERIMENT-12-11				
	AIM- To Polembify	AIM- To Polemtify the given inorganic Salt ZTIll2.			
	EXPERIMENT	OBSERVATIONS	INFERENCE.		
¥K	PRIMARY TEST-				
1.	Colour	white	Shows the absence of		
2.	Smell	No specific adoux.	AHL. CH3000 may be absent.		
*	DRY HEATING TE	ST			
3.	(nas evolved	(Dlaumless gas with pungent smell, white fumes with NH2 presence	U may be present		
ч.	Sublimate formed		NHIT, I are absent.		
5.	Decripitation	No deconipitation	Ph(NO3)2, NOW, KBS		
6.	Residuo	Yellow for hot white for cold	Zn21 may be present.		
7	Flame Test: Make Salt + Con(: HU paste	shows a grown flame	Formed present.		
8.	Dil Hason test.	No gas englued	(03, 52-, NO2, 5032-		
٩.	KMmoy Test: Salt + dil H2SO4	when cold, Pink colous of Kmnoy is discharged	U, Br. I may be		
40	and heat				

Expt. No.			Page No. 30
AIM:			Date
-10-	Comc. H2504 + Salt + Heat	Coloumless gas, pungent Smell, white fumes with	a may be present.
//-	Heat a pinch of Salt and conc.	No NH3 gas evolved	NHy absent.
12.	Shake the mix of Salt + Water	Solution is obtained	labelit as the original
13.	To a pant of 0.5	No ppt obtained	(nonoup T absent (Pb2t absent)
14.	Through the part of above, pass	No ppt obtained	Conoup II absent (Pb+2 cu+2 Ag2+, absent)
15.	To tumuining son. add pinch of NHyll boil, cool. and add NHyon	No ppt formed	(Fe3+, Al3+absent)
16.	To nemaining Sola and pinch of NHyll pass Hzs gas.	white ppt obtained	(2nt2, Mnt2 may be priesent).
	RESULT - Acidic Radical - C Basic Radical - 3	5.00%	
	PRECAUTIONS -	3.5	1
vision	Don't heat wet te	st tube.	Teacher's Signature :

Expt. No	Page No. 31
AIM:	
ii)	Don't impala umen lice o
iii)	Need test-type and for a fine day besting
iv)	Keep test-tube away from face while dry-heating.
	The state of the s

	AIM :	EXPERIMENT - +9 12-		
	AIM - To identify	the given inonganic Salt	ZmS04 .	
	EXPERIMENT	OBSERVATIONS	INFERENCE.	
	PRIMARY TEST.			
	1. Colous	white	Shows absence of Cu2+, Fe3+, Co2+, Mm2+	
2	5-mell	No specific smell	NHI, CH3cao, s2 may be	
*	DRY HEATING TEST-			
3	Gas evolved	No gas evolved	502-, (1, Bn, No3 are absent.	
ч. 5.	Sublimate formed Decriptation	No Sublimation	NH, Tare absent. Pb(NO3)2, Na(1, HBn are)	
6.	Residue	Hot → Yellow Cold → White	obsent. Znt 2 may be	
7.	Flame Test - Paste of Salt + Conc. HU & heated	Concern flame	Zn2ton Mn2+ may be	
	Dil Hosoy + Salt + Heat (if required)	No gas evalued	co32, S2, No2, So3 may	
9	Add KMmoy to Salt + dil H2504	Pink Colour of KMnOy is discharged.	(l, Br, I, Gog may	
3	Test for independent	in conc. HCL obtained	5042-is priesent-	
vision	Boil a small amount!	Ted	acher's Signature :	

AIM :	of salt with dil. Hu,		
	filter wit and add		
	few drops of Ball,		
	Solm		
11.	Heat a pinch of Salt	No ammonia gas	NHy absent.
	with conc. NaoH	evolved.	
12.	To a part original	No ppt obtained	Gonoup I absent
	Solution acled 1-2ml		(Pb2+ absent).
	of dil. Hill.		
13-	Thorough a pront of	No ppt formed	Conoup II absent
	prievious son, pass		(Pb2+ absemt)
	H25 gas		CLO (COSCILE)
14.	To gramaining som	Commod by all	Garaup II absent
	add pinch of	PP IOZINGO	(Fe3+, Al2+ absence).
	NHy (, boilthe		Cre, Ax .ausemie'.
	Som. (00) it down		
	and add excess		
	NHUN		
	18.1.4.8.1.		
1	RESULT-		
	Aria Ractical - Sa. 2	-	
	Acid Radical - Soy ² Basic Radical - 2n ²	†	
	Busic Musicus Zii		
	PRECAUTIONS -		
is	Never heat wet to	ct - tube	
(ii		um or poisonous gases	• .
iii	Kach tost - bib e	mas sala Medamas dila	0 0 1:
(vi	Man Ma manda	in a safe distance while	ony-hearing.
10)	Handle treagents	cone to lly.	
vision		1 1 10	12 11 14 11 14 12 18
			Teacher's Signature :

AIM:	EXPHERIMENT - 16-,15 AIM - To identify the given inorganic Salt (NH4)3PO4.		
	EXPERIMENT	OBSERVATIONS	INFERENCE.
¥	PRIMARY TEST.		
1.	Colous.	whit e	Shows absence of Ni2+, Fe3+, Co2+, Mn2+, NH4+ is
2.	Smell	Ammonical Smell	NHyt is priesent.
3.	DRY HEATING TEST	Colourless gas, pungent and sweet smell, white	NHy may be present.
ц. 5.	Sublimation Swelling Flame Test.	Salt swells	NHLt may be present.
	Make a paste of Salt + comc. HU & perton flame Test.	No specific smell	Cota, Sort, Bat, Cuzt, Znzt, Phat are obsent.
7.	Dil H2504 teneated with a pinch of Salt and shoot	No gas is enoused	Obsent.
8.	To a pinch of salt add dil. Hiso. (wwm & them add KMno,	peroalousise Kynon from Pink	(1, Bh, I, Czay and Fe ²⁺ are absent.

AIM:		1	
q.	+ Heat (if required)	No gas evolved	CH3 CDO absent
10.	Salt with come. Naon	Colourless gas, with Ammorial Smell evalued.	(NHy+ Present)
	RESULT-		
	Au'd Raditul - Poy Basic Radical - NH		
	PRECAUTIONS.		
0	Neven heat a we	test tube.	
2)		s which one unknown (poi	so mous.
 3)	Handle reagents	very carefully.	

AIM :	EXPERIMENT-+7.16		
	AIM- To identify the given morganic Salt NHyBr.		
	EXPERIMENT	OBSERVATIONS	INFERENCE
#	PRIMARY TEST -		
1.	(a)au9r	white	(u21, Ni21, Fe31, agre absent.
2.		Ammonial	NHy is present.
3.	Gas evolved	Colouniess gas, with	NHy may be present.
		characteristic smell gives	
		white homes when.	
4.	Sublimate formed	white Sublimate	NH's may be present.
	Flame Test : Make	No specific flame	Shows absence of Ca2+, Ba2+,
	a paste of Sult + Conc.		7m2+ Pb2+.
	Hle portosm flame		
	Test.		
6.	Theat a pinch of	No gas evolved	co3-, so3-, s2-, No, absemt.
	Salt with dil Hoson		
	& heat		
7.	Salt + dil KMmOx	Pink colour of KMmon	a. Brit may be present.
	heat it ama add	do colounises	
	a long of H2SO4		
8.	Salt + Com. Azson	Readish brown gas witha	Bri may be prosent.
	+ heat (if naguinal)	pungent adour Turns	
13	•	Feso, into black	
q.	Heat a pinch of	Colounless gas with	Conoup zeno prevent
T ₁	salt with Con Nach	ammonical smell	(NHL+ priesent).
	RESULT - 1) Acid	Radical - Bn-	
	2) Basi	c Rudical - NH4+	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
vision			Teacher's Signature :

Expt. No.	<u>₩</u>	Page No. 42
	PRECAUTIONS -	dame damentary
	No heating of wet test tube. Use test-tube away from body.	
3)	Handle reagents corefully.	
,		

AIM:	-	Exprome (212)	- I was a second and a second a
	AIM - To identify the size of		
	AIM - To identify the given Programic Salt (NH4)2 (03.		
	EXPERIMENT	CRSERVATIONS	INFERENCE.
1.	Colous	white	Shows absence of cu2+, Fe2+ Fe3+ Co2+
2-	Smell	Ammonical	NHy+ is peresent.
3.	Gas evolved	Colonless with chanadenishing	
		smell gives white formes	10.114
		when a Nesslen's Soll brown	
Ч.	Sublimation	white Sublimede	NHI maybe is present.
5.	Decarpitation	no decripitation	Ph(NO3)2, Nacl is absent.
6.	Flame Test	No specific flamo	Ca2+ 59+2 Ba2+, 7m2+ Db2+
	make paste of		are absent.
	Salt + Come HU &		
	flame tested.		
7.	Dil H2 SOL + Salt + A		(03- may be present.
		with brisk effernesemce	
8.	Salt + water	Salt does not dissolve	Involves Coz- indicated
٩.	Salt + comc. H2504	No gas enojne	(C, Bx, I, NO, CH3(00.
	+ heat cit suguismed)		Czoy2- and absent.
10.	Salt + Conc. H2504	No decolorisation	Indication of Carbonate
	+ heat (if nequired)		
	RESULTS -		
	Acio Radical → Ca32		
	Basic Radical -> NI	44+.	7
777			

	The state of the s
No	Page No. 44
7	Date
AIM :	PRECAUTIONS -
i	No heating of wet test-tubes
ii	use test-tube away from had.
iii	No heating of wet test-tubes. Use test-tube away from body Handle reagent carefully

Evot. No.	20-19		Page No.
			Date
AIM :		EXPERIMENT- 20- 19	
	AIM- To Polemtif	y the given inonganic Salt	5 x (NO3)2
	EXPERIMENT	OBSERVATION	INFERENCE.
100			
1.	Colous	white	shows obsence of Ni2+ Fe2+
	-		Fe3+, Co2+.
2.	Smell	No Specific Smell	NH4, CH3 COD-, 52 000
			absent.
3.	GOS Englised	Noz gas - Red-brown gas	Not may be present
1		turns Fesoy into black.	3 3 1
4.	Sublimate framed		Ph(NO3), Nall, HBs 15
0126	SEE		absent.
5.	Decnepitation	No decrepitation	NH, I cono absent.
6.	Residue	white residue which glows	Bazt, Smzt, Cazt, Mgzt may
1900	100	on heating	pe priesent.
7.	Flame Test:	Commson Red flame	Snit may be present.
4	Salt + Conc. HU		3
	& pontram test		
8.	Salt + dil HSO,	No gas evolved	co3-, s3-, No2, so3 is absent.
(7)	and heat som	•	3
q.	Salt + dil H2504	Pink colour of KMmoy was	(l, Br, T, C202, Fe2 may
14/2	L Heal + few	not discharged	be absent.
33	drops of	J	
250	KMnoy		
10.	Heat a pinch of	No ammonia gas	NHy absent.
4.000	salt with come.	evolved	wild mosemi.
178	Noon	TUUTUCG	
11.		Sol is obtained	101-01-11-0-0-11-1
- 5	Salt + water	JOI IS ODIWITED	label as oxiginal soin.
Vision	Twater	1 10 11	12 13 14 15 18 17 18 =

Expt. No			Date
AIM	:		
12.	To a point of o.s add 1-2ml of dil Hel	No ppt oblained	(noroup I absent
13.	Thomough a pant of this solmpass H25 908	No ppt formed	(ngroup II absent
14.	of this sorm.	No ppt frommed	(a ²¹ , Ba ²⁺ , Sh ²⁺ may be present).
	RESULT - Acidic Radical Basic Radical		
(i mi	Hamale Freage		
TYDE	11		

			D .
AIM:	II .		Date
	DIM T DO	EXPERIMENT - 2+ 20	6
	To Roomif To	Redemtify functional ground	p of aldehude. (-C-H)
			3 ()-
	EXPERIMENT	OBSERVATION	INFERENCE
1	Tit		
1.	rest ton unsaturation	Brown color of brumine	No Unsahination is
			present.
	Test for curboxylic	No effenuescence	Camboxylic group is absent
2	Junp		J J
<u>o</u> .	Test for phemolic	No green or violet colous	Phenolic moub is absent.
1.	droop	Obtained	3
4.	Test for alcoholic	No efferivescence	Alcoholic group is absent.
	Bunnp		3
<u> </u>	Test for Carbonyl	Orange - yellow ppt	Coorborny I group is present
1 72	duonp	Tommecl	may be an aldohy do on
	- 1 5 0		a Ketone.
6.		Silver mismore formed	Aldehyde is present.
	Bosonp	on immen side of test -	U
		tube	
_ 3 ·	Test for Amine	No offensive smelling	Amino group absent.
	To a small amount	gas is evolved	
	of rongamic ligitm		
	test-tube add 1-ml		
	Conc. HU & CHUZ.		
	Also add 2mLof		Lis.
	alc. KOH + Heat.	- 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	165
		April 1	
	RESULT-		
12.	The set of tests p	move the presence of	(- C-H) aldohydo
vision	- inchous dunch		
TRION	Kirim wines drawn at A	т	eacher's Signature :

	Page No. 50
Expt. No.	Date
AIM:	PRECAUTIONS -
i	
iiy	Keep a safe distance from test-tube while heating
iii)	Avoid inhalation of any fumes evalued which one
90)	Use a lab coat & gloves while dealing with commosive
_	chemicals.
	•
34	

LAPIT			Date
AIM:		EXPERIMENT-22 21	O
	AIM- To Polemtify	functional group of	Ketone (- c'-)
		· ·	
	EXPERIMENT	OBSERVATION	INFERENCE
1.	Test for unsaturation	n Borown colour of	No unsaturation is
	dissolve 0.2 ml	Bonomine not	present.
	of coly them	dischanged.	
	add Brz water	,	
2.	Test foor comboxy	No effervescence	Carboxylle acid, group is
	group 0.2ml of		absent.
	Compound + Pinch		
	of NOHCO3		
	9		
3.	Test for phemalic	No green on violet	Phenolic gnoup is
	120 - 400kg	Colum oblained	absent
	Compound + 2.3ml		CONTENTS
	of neutral Fells		
	solution.		
lı		No effenvescema e	Alaskalia amauh is
٩.	Test of alcoholic	No entenies centre	Alcoholic group is
5	group-Small		Crp?cwr.
	peice of sodium		
	+ 1 ml of given		
	(ampound	A Valor and	C
p.	Test foor Caribony)	Ostange - Yellow ppt	(Aldehyda / Ketona)
Trace	group, shake	formed.	(Aldehyde / Ketone).
9 7	0.2 ml of		
	2.3 - di-nitaro		
	phemyl hydrazine		
	4		

AIM		ne functional group of	Alcohol (-OH).
	EXPERIMENT	OBSERVATIONS	INFERENCE
1.	Test for unsahouted dissolve 0.2ml of Compound. Pro 2ml of 6 Culy them add Bry coates.	Brown Colour of Bromine not dischar- ged	No unsaturation present.
2.	Test for the Carboxylic group 1-0.2ml Compound t pinch of Nahloz	No efferivesence	Corboxylic group is
3.	Test for phemolic group - 0.2 ml organic Compounds +2-3 ml Fellz Sor	No green on violet Coloun obtained.	Phemolic group is absent
yision	Test For Carbonyl group: Shake 0.2 ml of the Compound t 2-3 ml of 2,3 d:-nitro phony 1 hydrozino.	No ppt obtained	Conborny 1 group is

Expt. N	io		Page No54
AD	1		
5	Test for alcoholic group: Small piece of N2+	Effenvesemce obtained	Alcohol group is present.
	und of compo-		
	RESULT- The given ongo	imic Compound cont	ains alcoholic (-OH)group.
	PRECAUTIONS -		
1)	Fella solm should	be freshly prepared	
- 11)	Bnz water should	a be humdolod cas	sefully.
111)	Ummeacted 'No'	should not be di	sposed directly into the

Expt. No. 23		Page No. —
Identify the fu	metional proponi	un the gillen
Engance Composine	Cartraylie als	
Caperiment	About 11 cition	Inference
777 Under strong		
Dissolue 0.2 ml Com	Brown Colour	No Unaturat
in trol (cly then	of bxomine not	is present.
	discharged	
12 State State State		
Add 0.2 ml Compun	No green Wirlet	phenolic grp
Hdd O.2 ml Compun	Colour obburied	us present
2-3 ml neutral fects		
Lead of a state		
Small prete of Nat Iml of gillen lig	no effectleter	Moholie group
1 ml 124 cuiles lie	and the same of th	us absent.
July 3		
test for Cartenyla		
-Shook 0.2 ml up Comp	no orange yellos	Caxtony 1 grpats
With 2.3 ml or 2,3	ant formed	Aldebude and
directeophony bydron		Aldebyde and Ketone are about
, , ,		and the second s
Test for Curtons		
lie grp - 0.7 ml	effertlanters	Carteryliè gep
of Comp + pinch	obkuned	un propent
of NaHCO3		

y say,		Date —
Comfirma long for		a se
10 gep-0. 10 Com	A druit	-Capt is
+ Im logethy!	A fruity Smell	Confirmed
alusholand 1-2		
drop of cone.	obtained	
1790 y thout the	The second secon	RCODH+C2H5DH
van mixture on		RCOOH+CZHSDH HZWIG RCOOCZHS
a bealer Co		+H20
Contouring		bruity
Water	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Somol
man de la companya della companya de		
and the second		de la companya della companya della companya de la companya della
Popult -> The organic Compound Contain. Cartroglie (- CODH) group.		
Carbonelie (- CODH) azorep.		
as the first of and the same of the same o		
preloutions ->		
Lecla Sola Should be frontly propared.		
1572 Water Should be ham dolod with		
Unrouted his moter should not be through		
un Sink directly		
all about the state of the stat		