

# CHEMISTRY Lab Manual XII

**Apeksha Publication** 

# CHEMISTRY LAB MANUAL with VIVA VOCE

Class XII

By

Dr. Vinita Kapoor

Ph.D., M.Sc. (Chem.) Gold Medalist Asst. Professor Sri Venkateswara College University of Delhi

Apeksha Publication
New Delhi

# CONTENTS

1.	. SURFACE CHEMISTRY			
	1.1	To prepare lyophilic sols of starch, egg albumin and gum.	9	
	1.2	To prepare lyophobic sols of aluminium hydroxide, ferric hydroxide and arsenious sulphide	11	
	1.3	To purify prepared egg albumin sol by dialysis.	12	
	1.4	To study the role of emulsifying agents in stabilising the emulsions of different oils	13	
2.	CH	EMICAL KINETICS		
	2.1	To study the effect of concentration and temperature on the rate of reaction between sodium thiosulphate and hydrochloric acid.		
	2.2	To study the effect on rate of reaction of iodide ion with hydrogen peroxide at room temperature at different concentration of iodide ions.		
	2.3	To study reaction rate of reaction between potassium iodate, $(KIO_3)$ and sodium sulphate $(Na_2SO_3)$ using starch solution as indicator at room temperature		
3.	THI	ERMOCHEMISTRY	23	
	3.1	To determine the enthalpy of dissolution of copper sulphate or potassium nitrate.		
	3.2	To determine the enthalpy of neutralisation of strong acid (HCl) and strong base (NaOH)		
	3.3	To determine the enthalpy change during interaction between acetone and chloroform		
		(hydrogen bond formation)	27	
4.	ELI	ECTROCHEMISTRY	31	
	4.1	To study the variation of cell potential of the cell Zn   Zn <sup>2+</sup>   Cu <sup>2+</sup>   Cu with change in		
		concentration of electrolyte ( $CuSO_4 \mid ZnSO_4$ ) at room temperature.	32	
5.	. CHROMATOGRAPHY			
	5.1	To separate the pigments from extracts of leaves (spinach) and flowers (rose, marigold) by paper chromatography and determination of $\mathbf{R}_f$ values.	36	
	5.2	To separate the constituents present in an inorganic mixture containing two cations,		
		Pb <sup>2+</sup> and Cd <sup>2+</sup> , using chromatographic technique.	37	
6.	PRI	EPARATION OF INORGANIC COMPOUNDS	40	
	6.1	To prepare double salts: potash alum and Mohr's salt.		
	6.2	To prepare potash alum trioxalato ferrate (III).		
7.	PRI	EPARATION OF ORGANIC COMPOUNDS	44	
	7.1	To prepare acetanilide.		
	7.2	To prepare dibenzalacetone (Dibenzylideneacetone).	45	
	7.3	To prepare p-nitroacetanilide.		
	7.4	To prepare aniline yellow (p-aminoazobenzene).		
	7.5	To prepare 2-Naphthol aniline dye (phenyl-azo-β-naphthol).		
	7.6	To prepare iodoform.	49	

		CROUDS PRESENT IN ORGANIC COMPOUND					
8	TEST FOR THE FUNCTIONAL GROUPS PRESENT IN ORGANIC COMPOUND						
	1. Test for unsaturation						
		st for alcoholic group (-OH)					
	2. Tes	st for phenolic group (Ar—OH)					
	5. 16	O II					
	4 Tes	st for Aldehydic and ketonic groups [— CHO and — C—]					
	5. Tes	st for carboxylic group (-COOH)					
	6. Tes	st for primary amine gp. (-NH <sub>2</sub> )					
		Recording of identification of the functional group present in a given organic compound					
	To identity	the functional group present in the given organic compound.	56				
			00				
9.	TESTS OF	F CARBOHYDRATES, FATS AND PROTEINS AND					
	THEIR DI	ETECTION IN FOOD SAMPLE	58				
	9.1 To stu	ady the characteristic tests of carbohydrates, fats and proteins in pure state tect the presence of carbohydrates, fats and proteins in the given sample of food sample	58				
0.	VOLUME	TRIC ANALYSIS	61				
	10.1 To det	termine the molarity of potassium permanganate solution by titrating it against standard solution of oxalic acid. Also to determine the strength of KMnO <sub>4</sub> solution	61				
	m 1	solution by titrating it					
	10.2 To det	st a standard solution of ferrous ammonium sulphate (Mohr's salt).	63				
1.		TIVE ANALYSIS					
	11.1 To det	To detect one cation and one anion in a given salt from the following:					
	Catio	ons: $Pb^{2+}$ , $Cu^{2+}$ , $As^{3+}$ , $Al^{3+}$ , $Fe^{3+}$ , $Mn^{2+}$ , $Ni^{2+}$ , $Zn^{2+}$ , $Co^{2+}$ , $Ca^{2+}$ , $Sr^{2+}$ , $Ba^{2+}$ , $Mg^{2+}$ , $NH_4^+$ .					
	Anio	Anions: $CO_3^{2-}$ , $S^{2-}$ , $SO_3^{2-}$ , $SO_4^{2-}$ , $NO_2^-$ , $NO_3^-$ , $Cl^-$ , $Br^-$ , $l^-$ , $PO_4^{3-}$ , $C_2O_4^{2-}$ , $CH_3COO^-$ .					
	Insolu	Insoluble salts excluded					
	Sneci	imen Record of Analysis of a Salt	-0				
	To an	alysis the given salt for the cation and anion present in it.	79				
		INVESTIGATORY PROJECT					
			82				
	Project 1	To determine the oxalate content in guava fruit at different stages of its ripening	83				
	Project 2	To prepare fire retardant solution.	84				
	Project 3	To study the quantity of casein present in different samples of milk.					
	Project 4	To compare the rate of fermentation of the given samples of wheat nour,	80				
	Project 5	To atridy the digretion of starch by galiya					
	Project 6	To detect the presence of $NO_2^-$ in different varieties of Brinjal — purple, white and green.	30				
	1 Toject o	To desire in proposed of 110g an amount of the feet of					

## Apeksha Publication New Delhi

ISBN: 978-93-83914-25-8

**New Edition** 

### Printed at:

We welcome your feedback & thoughts, Based on your feedback, you can help us decide what are the most important things to work on with the next version of this book.

### © Publisher

All rights reserved. No part of this publication may be reproduced, stored in or introduced into retrieval system or transmitted in any form or by any means (electronic, mechanical, photo copy, recording or otherwise) without the written permission of the publisher of this book.