

# **Organic Chemistry II**

**Chem 2208**

**Lab Manual**

**(Revised 9/2022)**

# 2208 Lab Manual

**Er. Meera Goyal**



## 2208 Lab Manual:

**The Fusarium Laboratory Manual** John F. Leslie, Brett A. Summerell, 2008-02-28 For the first time in over 20 years a comprehensive collection of photographs and descriptions of species in the fungal genus *Fusarium* is available This laboratory manual provides an overview of the biology of *Fusarium* and the techniques involved in the isolation identification and characterization of individual species and the populations in which they occur It is the first time that genetic morphological and molecular approaches have been incorporated into a volume devoted to *Fusarium* identification The authors include descriptions of species both new and old and provide protocols for genetic morphological and molecular identification techniques The *Fusarium Laboratory Manual* also includes some of the evolutionary biology and population genetics thinking that has begun to inform the understanding of agriculturally important fungal pathogens In addition to practical how to protocols it also provides guidance in formulating questions and obtaining answers about this very important group of fungi The need for as many different techniques as possible to be used in the identification and characterization process has never been greater These approaches have applications to fungi other than those in the genus *Fusarium* This volume presents an introduction to the genus *Fusarium* the toxins these fungi produce and the diseases they can cause The *Fusarium Laboratory Manual* is a milestone in the study of the genus *Fusarium* and will help bridge the gap between morphological and phylogenetic taxonomy It will be used by everybody dealing with *Fusarium* in the Third Millennium W F O Marasas Medical Research Council South Africa *Materials Laboratory Procedures Manual* United States. Bureau of Reclamation, 1957 *A Laboratory Manual of Experiments in Physics* Leonard Rose Ingersoll, 1925 ***A Laboratory Manual of Organic Chemistry*** Dr. Lassar-Cohn, Alexander Smith, 1895 *Laboratory Manual in General College Chemistry* Joseph Albert Babor, Alexander Lehrman, 1929 ***Laboratory Manual of Organic Chemistry*** Harry Linn Fisher, 1920 ***Journal of the American Chemical Society*** American Chemical Society, 1917 Issues for 1898 1901 include Review of American chemical research v 4 7 1879 1937 the society's Proceedings ***A Laboratory Manual in Physics*** Newton Henry Black, 1913 ***Practical/Laboratory Manual Chemistry Class - XI*** Er. Meera Goyal, 2021-05-29 1 Basic Laboratory Techniques 1 To cut a glass tube or glass rod 2 To bend the glass rod at an angle 3 To draw a glass jet from a glass tube 4 To bore a cork and fit a glass tube into it Viva Voce 2 Characterisation and Purification of Chemical Substances 1 To determine the melting point of the given unknown organic compound and its identification simple laboratory technique Viva Voce 2 To determine the boiling point of a given liquid when available in small quantity simple laboratory method Viva Voce 3 To prepare crystals of pure potash alum  $K_2SO_4 \cdot Al_2(SO_4)_3 \cdot 24H_2O$  from the given impure sample 4 To prepare the pure crystals of copper sulphate from the given crude sample 5 To prepare pure crystals of benzoic acid from a given impure sample Viva Voce 3 Measurement of pH Values 1 To determine the pH value of vegetable juices fruit juices tap water and washing soda by using universal pH paper 2 To determine and compare the pH values of solutions of strong acid HCl and

weak acid  $\text{CH}_3\text{COOH}$  of same concentration 3 To study the pH change in the titration of strong base Vs strong acid by using universal indicator paper 4 To study the pH change by common ion  $\text{CH}_3\text{COO}^-$  ion in case of weak acid  $\text{CH}_3\text{COOH}$  5 To determine the change in pH value of weak base  $\text{NH}_4\text{OH}$  in presence of a common ion  $\text{NH}_4^+$  Viva Voce 4 Chemical Equilibrium 1 To study the shift in equilibrium between ferric ions and thiocyanate ions by changing the concentrations of either of the ions 2 To study the shift in equilibrium between  $\text{Co}^{2+}$  and  $\text{Cl}^-$  ions by changing the concentrations of either of the ions Viva Voce 5 Quantitative Analysis 1 To prepare M 10 oxalic acid solution by direct weighing method 2 To prepare M 10 solution of sodium carbonate by direct weighing method 3 To determine the strength of given solution of sodium hydroxide by titrating it against N 10 or M 20 solution of oxalic acid 4 To determine the strength of a given solution of hydrochloric acid by titrating it against a standard N 10 or M 20 sodium carbonate solution Viva Voce 6 Qualitative Analysis Analysis of Anions Analysis of Cations Viva Voce 7 Detection of Elements in Organic Compounds 1 To detect the presence of nitrogen sulphur and halogens in a given organic compound by Lassaigne's test 2 To detect the presence of nitrogen sulphur and halogens in the given organic compound sample number by Lassaigne's test Viva Voce INVESTIGATORY PROJECTS 1 Checking of Bacterial Contamination in Water 1 To check the bacterial contamination in drinking water by testing sulphide ions Viva Voce 2 Methods of Water Purification 1 To purify water from suspended impurities by using sedimentation 2 To purify water by boiling 3 To purify water by distillation method 4 To purify water by reverse osmosis technique 5 To purify water by GAC method 6 To purify water by bleach treatment 7 To purify water by oxidising agent 8 To purify water by ozone treatment method Viva Voce 3 Water Analysis 1 To test the hardness of different water samples Viva Voce 4 Foaming Capacity of Various Soaps 1 To compare the foaming capacity of different washing soaps 2 To study the effect of addition of sodium carbonate on foaming capacity of washing soap Viva Voce 5 Tea Analysis 1 To study the acidity of different samples of tea leaves tea by using pH paper Viva Voce 6 Analysis of Fruits and Vegetable Juices 1 To analysis the fruit and vegetable juices for the constituent present in them Viva Voce 7 Rate of Evaporation 1 To study the rate of evaporation of different liquids IViva Voce 8 Effect of Acids and Bases on Tensile Strength of Fibres 1 To compare the tensile strength of natural fibres and synthetic fibres 2 To study the effect of acids and bases on tensile strength of different fibres Viva Voce

*Practical/Laboratory Manual Chemistry Class XII based on NCERT guidelines by Dr. S. C. Rastogi, Er. Meera Goyal* Dr. S. C. Rastogi ,Er. Meera Goyal,2020-06-22 A Surface Chemistry 1 To prepare colloidal solution sol of starch 2 To prepare a colloidal solution of egg albumin 3 To prepare colloidal solution of gum 4 To prepare colloidal solution of aluminium hydroxide  $\text{Al}(\text{OH})_3$  5 To prepare colloidal solution of ferric hydroxide  $\text{Fe}(\text{OH})_3$  6 To prepare colloidal solution of arsenious sulphide  $\text{As}_2\text{S}_3$  7 To purify a freshly prepared sol by dialysis 8 To compare the effectiveness of different common oils Castor oil cotton seed oil coconut oil kerosene oil mustard oil in forming emulsions Viva Voce B Chemical Kinetics 1 To study the effect of concentration on the rate of reaction between sodium thiosulphate and hydrochloric acid 2 To study the effect of

temperature on the rate of reaction between sodium thiosulphate and hydrochloric acid 3 To study the rate of reaction of iodide ions with hydrogen peroxide at different concentrations of iodide ions 4 To study the rate of reaction between potassium iodate  $\text{KIO}_3$  and sodium sulphite  $\text{Na}_2\text{SO}_3$  using starch solution as indicator

**Viva Voce C Thermochemistry** 1 Determine the enthalpy of dissolution of copper sulphate  $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$  in water at Room temperature 2 To determine the enthalpy of neutralization of the reaction between  $\text{HCl}$  and  $\text{NaOH}$  3 To determine enthalpy change during the interaction between acetone and chloroform

**Viva Voce D Electrochemistry** 1 To study the variation of cell potential in  $\text{Zn} | \text{Zn}^{2+} || \text{Cu}^{2+} | \text{Cu}$  with change in concentration of electrolytes  $\text{CuSO}_4$  or  $\text{ZnSO}_4$  at room temperature

**Viva Voce E Chromatography** 1 To separate the coloured components pigment present in the given extract of leaves and flowers by ascending paper chromatography and find their  $R_f$  values 2 To separate the coloured components present in the mixture of red and blue inks by ascending paper chromatography and find their  $R_f$  values 3 To separate  $\text{Co}^{2+}$  and  $\text{Ni}^{2+}$  ions present in the given mixture by using ascending paper chromatography and determine their  $R_f$  values

**Viva Voce F Preparation of Inorganic Compounds** 1 Preparation of double salt of ferrous ammonium sulphate Mohr's salt from ferrous sulphate and ammonium sulphate 2 To prepare a pure sample of potash alum fitkari 3 Preparation of crystals of potassium ferric oxalate or potassium trioxalato ferrate III

**Viva Voce G Preparation of Organic Compounds** 1 Preparation of iodoform from ethyl alcohol or acetone 2 Preparation of acetanilide in laboratory 3 Preparation of  $\beta$ -Naphthol aniline dye 4 To prepare a pure sample of dibenzalacetone 5 To prepare a pure sample of p-nitro acetanilide

**Viva Voce H Tests for the Functional Groups Present in Organic Compounds** 1 To study simple reactions of carbohydrate 2 To study simple reactions of fats 3 To study simple reactions of proteins 4 To investigate presence of carbohydrates fats and proteins in food stuffs

**Viva Voce J Volumetric Analysis** 1 To prepare 250 ml of M/10 solution of oxalic acid 2 To prepare 250 ml of M/10 solution of ferrous ammonium sulphate 3 Prepare M/20 solution of oxalic acid with its help find out the molarity and strength of the given solution of potassium permanganate 4 Prepare M/20 solution of Mohr's salt using this solution determine the molarity and strength of potassium permanganate solution

**Viva Voce K Qualitative Analysis**

**INVESTIGATORY PROJECTS** 1 To study the presence of oxalate ions in guava fruit at different stages of ripening 2 To study the quantity of casein present in different samples of milk 3 Preparation of soyabean milk and its comparison with natural milk with respect to curd formation effect of temperature etc 4 To study the effect of potassium bisulphite as food preservative at various concentrations 5 To study the digestion of starch by salivary amylase and the effect of pH and temperature on it 6 To study and compare the rate of fermentation of the following materials wheat flour gram flour potato juice and carrot juice 7 To extract essential oils present in saunf aniseed ajwain coriander cardamom 8 To detect the presence of adulteration in fat oil and butter 9 To investigate the presence of  $\text{NO}_2$  in brinjal

**Laboratory Manual for Oceanography** William J. Wallace, Charles F. Phleger, 1979 **Field Guide and Catalog of Copyright Entries.**

**Third Series** Library of Congress. Copyright Office, 1977      **Practical/Laboratory Manual Physics Class - XII -by Er. Meera Goyal (SBPD Publications)** Er. Meera Goyal, 2021-07-03 In accordance to the new syllabus of Central Board of Secondary Education CBSE New Delhi and other State Boards following CBSE Curriculum      Practical/Laboratory Manual Physics Class XII based on NCERT guidelines by Dr. Sunita Bhagia & Megha Bansal Dr. J. P. Goel, Er. Meera Goyal, 2020-06-24

**SECTION A EXPERIMENTS**

- 1 To determine resistance per cm of a given wire by plotting a graph for potential difference versus current
- 2 To find resistance of a given wire using meter bridge and hence determine the specific resistance Resistivity of its material
- 3 To verify the laws of combination Series Parallel of resistance using ammeter bridge
- 4 To compare the e.m.f. of two given primary cells using potentiometer
- 5 To determine the internal resistance of a given primary cell e.g. Leclanche cell using potentiometer
- 6 To determine the resistance of a galvanometer by half deflection method and to find its figure of merit
- 7 A To convert a given galvanometer of known resistance and figure of merit into an ammeter of desired range and to verify the same
- 7 B To convert a given galvanometer of known resistance and figure of merit into a voltmeter of desired range and to verify the same
- 8 To find the frequency of AC mains with a sonometer and horse shoe magnet

**SECTION B EXPERIMENTS**

- 1 To find the value of  $v$  for different values of  $u$  in case of a concave mirror and to find the focal length
- 2 To find the focal length of a convex lens by plotting graph between  $u$  and  $v$  or  $1/u$  and  $1/v$
- 3 To find the focal length of a convex mirror using a convex lens
- 4 To find the focal length of a concave lens using a convex lens
- 5 To determine the angle of minimum deviation for a given prism by plotting a graph between the angle of incidence and angle of deviation
- 6 To determine refractive index of a glass slab using a travelling microscope
- 7 To find the refractive index of a liquid by using a convex lens and a plane mirror
- 8 To draw I-V characteristics curve of a p-n junction in forward bias and reverse bias
- 9 To draw the characteristics curve of a Zener diode and to determine its reverse break down voltage
- 10 To study the characteristics of a common emitter n-p-n or p-n-p transistor and to find out the values of current and voltage gains

**SECTION A ACTIVITIES**

- 1 To measure the resistance and impedance of an inductor with or without iron core
- 2 To measure resistance voltage AC DC current AC and check continuity of given circuit using multimeter
- 3 To assemble a household circuit comprising of three bulbs three on/off switches a fuse and a power source
- 4 To assemble the components of a given electrical circuit
- 5 To study the variation in potential drop with length of a wire for a steady current
- 6 To draw the diagram of a given open circuit comprising at least a battery resistor rheostat key ammeter and voltmeter Make the components that are not connected in proper order and correct the circuit and also the circuit diagram

**SECTION B ACTIVITIES**

- 1 To study effect of intensity of light by varying distance of the source on an LDR Light Depending Resistor
- 2 To identify a diode a LED a transistor an IC a resistor and a capacitor from mixed collection of such items
- 3 Use a multimeter to i identify the transistor ii distinguish between n-p-n and p-n-p type transistor iii see the unidirectional flow of current in case of a diode and a LED iv Check whether a given electronic components e.g. diode transistor or IC is in working order
- 4 To observe refraction and

lateral deviation of a beam of light incident obliquely on a glass slab 5 To observe polarisation of light using two polaroids 6 To observe diffraction of light due to a thin slit 7 To study the nature and size of the image formed by i convex lens ii concave mirror on a screen by using candle and a screen for different distance of the candle from the lens mirror 8 To obtain a lens combination with the specified focal length by using two lenses from the given set of lenses

**SUGGESTED INVESTIGATORY PROJECT**

- 1 To Study Various factors on which the Internal Resistance EMF of a cell depends
- 2 To study the variations in current following in a circuit containing L D R because of variation
  - a In the power of incandescent lamp used to illuminate the L D R
  - b Keeping all the lamps in fixed position
  - c In the Distance of a incandescent lamp of fixed power used to illuminate the L D R
- 3 To find the refractive indices of a Water b Oil Transparent using a plane mirror an equiconvex lens made from a glass of known refractive index and an adjustable object needle
- 4 To design an appropriate logic gate combination for a given truth table
- 5 To investigate the relation between the ratio of i Output and Input voltage ii Number of turns in secondary coils and primary coils of a self designed transformer
- 6 To Investigate the dependence of angle of deviation on the angle of incidence using a hollow prism filled one by one with different transparent fluids
- 7 To Estimate the charge induced on each one of the two identical styrofoam balls suspended in a vertical plane by making use of Coulomb's Law
- 8 To study the factors on which the self inductance of a coil depends by observing the effect of this coil when put in series with a resistor bulb in a circuit fed up by an a c source of adjustable frequency
- 9 To study the earth's magnetic field using a tangent galvanometer

**APPENDIX** Some Important Tables of Physical Constants Logarithmic and other Tables

Practical/Laboratory Manual

Physics Class XI based on NCERT guidelines by Dr. J. P. Goel & Er. Meera Goyal Dr. J. P. Goel ,Er. Meera Goyal,2020-06-26

**EXPERIMENTS**

- 1 Measurement of Length
  - 1 To measure the diameter of a small spherical cylindrical body by using a vernier callipers
  - 2 To measure the dimensions of a given regular body of known mass using vernier callipers and hence find its density
  - 3 To measure the internal diameter and depth of a given cylindrical vessel say calorimeter beaker by using vernier callipers and hence find its internal volume i e capacity
- 2 Screw Gauge Micrometer
- 4 To determine the diameter of a given wire using a screw gauge and find its volume
- 5 To find the thickness of a given sheet with the help of screw gauge
- 6 To measure the volume of an irregular lamina by using a screw gauge
- 3 Spherometer
- 7 To measure the radius of curvature of a given spherical surface convex lens by using a spherometer
- 4 Mass and Weight
- 8 To determine the mass of two different objects using a beam balance
- 5 Parallelogram Law of Vectors
- 9 To find the weight of a given body using parallelogram law of vectors
- 6 Simple Pendulum Measurement of Time
- 10 Using a simple pendulum plot L T and L T<sup>2</sup> graphs Hence find the effective length of a second's pendulum using appropriate graphs
- 7 Friction
- 11 To study the relationship between force of limiting friction and normal reaction and to find the coefficient of friction between a block and a horizontal surface
- 8 Motion of a Body Along an Inclined Plane
- 12 To find the downward force along an inclined plane acting on a roller due to gravitational pull of the earth and study its relationship with

the angle of inclination by plotting graph between force and  $\sin \theta$  Viva voce

**SECTION B EXPERIMENTS**

1 Elasticity 1 To determine the Young's modulus of elasticity of the material of the wire using Searle's apparatus Viva voce

2 Spring Constant 2 To find the spring constant of a helical spring by plotting load extension graph Viva voce

3 Boyle's Gas Law 3 To study the variation in volume with pressure for a sample of air constant temperature by plotting graphs between P and V and between P and  $\frac{1}{V}$  Viva voce

4 Surface Tension 4 To determine the surface tension of water by capillary rise method Viva voce

5 Viscosity 5 To determine the coefficient of viscosity of given liquid by measuring the terminal velocity of a given spherical body in it Viva voce

6 Newton's Law of Cooling 6 To study the relationship between temperature of a hot body and time by plotting a cooling curve Viva voce

7 Vibrations of Strings 7 To study the relation between frequency and length for a given wire under constant tension using a sonometer Viva voce

8 To study the relation between the length of a given wire and tension for constant frequency using sonometer Viva voce

8 Vibrations of Air Columns 9 To find the velocity of sound in air at room temperature using a resonance tube by two resonance position Viva voce

9 Specific Heat 10 To determine specific heat of a given solid by the method of mixture 11 To determine the specific heat of a given liquid by method of mixture Viva voce

**SECTION A ACTIVITIES**

1 To make a paper scale of given least count e.g. 0.2 cm, 0.5 cm and use it to measure the length of a given object

2 To determine the mass of a given body using a metre scale and by applying principle of moments Viva voce

3 To plot a graph for a given set of data using proper choice of scales and error bars Viva voce

4 To measure the force of limiting friction for rolling of a roller on horizontal plane Viva voce

5 To study the variation in the range of a jet of water with angle of projection Viva voce

6 To study the conservation of energy of a ball rolling down on inclined plane using a double inclined plane Viva voce

7 To study dissipation of energy of a simple pendulum by plotting a graph between square of amplitude and time Viva voce

**SECTION B ACTIVITIES**

1 To observe the change of the state and plot a cooling curve for molten wax Viva voce

2 To observe and explain the effect of heating on a bimetallic strip Viva voce

3 To note the change in level of liquid in a container on heating and interpret the observations Viva voce

4 To study the effect of detergent in surface tension by observing capillary rise Viva voce

5 To study the factors affecting the rate of loss of heat of a liquid Viva voce

6 To study the effect of load on depression of a suitably clamped meter scale loaded i) at its end ii) in the middle Viva voce

7 To observe the decrease in pressure with the increase in velocity of the fluid Viva voce

**APPENDIX** Some Important Tables of Physical Constants Log Antilog and other Tables

**Core Laboratory Manual of Physics for Class XI** Anil Sharma, Prashant Sharma, Goyal Brothers Prakashan, 2020-04-16 Goyal Brothers Prakashan

Prospects and Applications for Plant-Associated Microbes, A laboratory manual Seppo Sorvari, Anna Maria Pirttilä, 2014-12-15 Research on the microbial colonization of the aerial and subterranean tissues of plants has shown an extensive scale of interactions between the hosts and a range of microbes including bacteria and fungi. Intercellular spaces, vascular systems and even single cells can be inhabited by these endophytic microbes. Of the bacterial endophytes only a small percentage is harmful to the plant, most are



neutral opportunistic or beneficial These plant based bacteria can have various important functions throughout the life cycle of the plant some promote plant growth and development others protect the plant from diseases This ability to be able to protect plants from diseases has catalyzed numerous laboratories to search for new bacteria that could be utilized instead of the traditional plant protective agents Because two or more interacting organisms are involved research and the eventual application of suitable bio controlling microbes are challenging and often require specific skills and equipment The purpose of this book is to provide a comprehensive review for those who are interested in the research and biotechnological applications of plant associated bacteria It also provides a compilation of current work conducted on plant bacteria interactions

**Practical/Laboratory Manual Physics Class - 12** Er. Meera Goyal,2023-04-30 Sections A 1 Experiments 2 Activities Sections B 1 Experiments 2 Activities 3 Suggested Investigatory 4 Project Work *A Laboratory Manual in Physics to Accompany Black [and] Davis "Practical Physics."* Newton Henry Black,1918 *Hazardous Laboratory Chemicals Disposal Guide* Margaret-Ann Armour,2016-04-19 A perennial bestseller this third edition includes individual entries for over 300 compounds The extensive list of references has been updated and includes entries for 15 pesticides commonly used in greenhouses Emphasis is placed on disposal methods that turn hazardous waste material into non toxic products These methods fall into several categories including acid base neutralization oxidation or reduction and precipitation of toxic ions as insoluble solids The text also provides data on hazardous reactions of chemicals assisting laboratory managers in developing a plan of action for emergencies such as the spill of any of the chemicals listed

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### Table of Contents **2208 Lab Manual**

1. Understanding the eBook 2208 Lab Manual
  - The Rise of Digital Reading 2208 Lab Manual
  - Advantages of eBooks Over Traditional Books
2. Identifying 2208 Lab Manual
  - Exploring Different Genres
  - Considering Fiction vs. Non-Fiction
  - Determining Your Reading Goals
3. Choosing the Right eBook Platform
  - Popular eBook Platforms
  - Features to Look for in an 2208 Lab Manual
  - User-Friendly Interface
4. Exploring eBook Recommendations from 2208 Lab Manual
  - Personalized Recommendations
  - 2208 Lab Manual User Reviews and Ratings
  - 2208 Lab Manual and Bestseller Lists

5. Accessing 2208 Lab Manual Free and Paid eBooks
  - 2208 Lab Manual Public Domain eBooks
  - 2208 Lab Manual eBook Subscription Services
  - 2208 Lab Manual Budget-Friendly Options
6. Navigating 2208 Lab Manual eBook Formats
  - ePub, PDF, MOBI, and More
  - 2208 Lab Manual Compatibility with Devices
  - 2208 Lab Manual Enhanced eBook Features
7. Enhancing Your Reading Experience
  - Adjustable Fonts and Text Sizes of 2208 Lab Manual
  - Highlighting and Note-Taking 2208 Lab Manual
  - Interactive Elements 2208 Lab Manual
8. Staying Engaged with 2208 Lab Manual
  - Joining Online Reading Communities
  - Participating in Virtual Book Clubs
  - Following Authors and Publishers 2208 Lab Manual
9. Balancing eBooks and Physical Books 2208 Lab Manual
  - Benefits of a Digital Library
  - Creating a Diverse Reading Collection 2208 Lab Manual
10. Overcoming Reading Challenges
  - Dealing with Digital Eye Strain
  - Minimizing Distractions
  - Managing Screen Time
11. Cultivating a Reading Routine 2208 Lab Manual
  - Setting Reading Goals 2208 Lab Manual
  - Carving Out Dedicated Reading Time
12. Sourcing Reliable Information of 2208 Lab Manual
  - Fact-Checking eBook Content of 2208 Lab Manual
  - Distinguishing Credible Sources
13. Promoting Lifelong Learning

- Utilizing eBooks for Skill Development
  - Exploring Educational eBooks
14. Embracing eBook Trends
- Integration of Multimedia Elements
  - Interactive and Gamified eBooks

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