

EXPERIMENT 6

HIGH PERFORMANCE LIQUID CHROMATOGRAPHY/HIGH PRESSURE LIQUID CHROMATOGRAPHY (HPLC)

THEORY/ BACKGROUND

In recent years the technology used in chromatographic analysis has greatly improved. Advances in this area have led to the common use of High Performance Liquid Chromatography, a laboratory technique that allows for the very efficient separation of small amounts of the components of a mixture. The technique has essentially the same operational basis as liquid chromatography, but HPLC allows for far better separation of the components of a mixture. The column in an HPLC instrument contains tiny particles of only about 5 μm diameter, ensuring a very large surface area to which molecules may adsorb. These particles comprise the *stationary phase* of the chromatographic system. Because these tiny particles are so tightly packed, the *mobile phase* solvent must be forced through the column under very high pressure. A detector and a computer are connected to the HPLC instrument in order to signal when eluents are coming off the column and fractions should be collected. The diagram in Figure 6 illustrates the main components of an HPLC instrument.

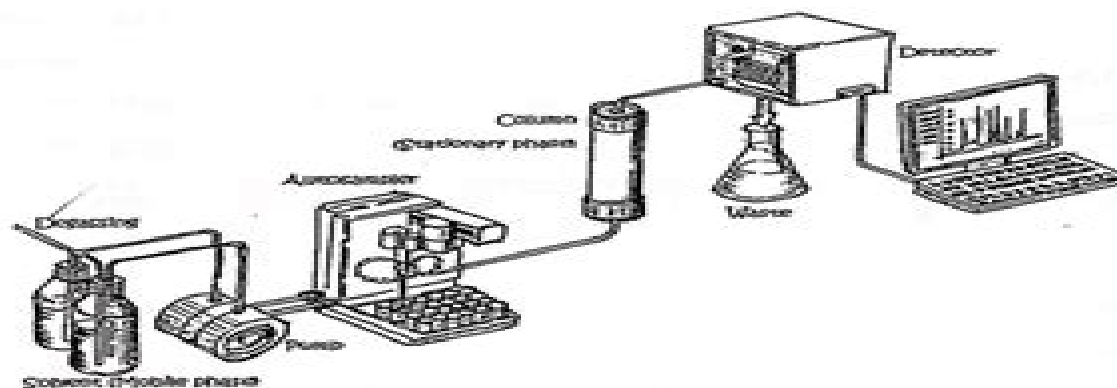
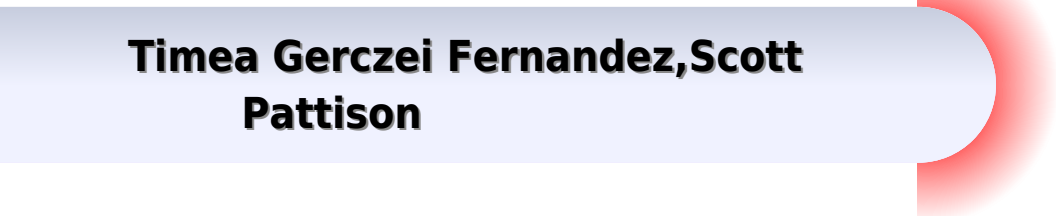


Figure 6.1: Schematic Diagram of a High Performance/ Pressure Liquid Chromatography.

Identification of samples is carried out by comparison of their retention times. A known amount of a known compound (a standard) is injected, the retention time is recorded and the area under the peak can be calculated. A sample containing the same analyte is then injected under the same experimental parameters. If the analyte is the same compound as the standard, then they should give identical retention times. The ratio of peak areas should give the amounts of the components present.

Hplc Lab Manual

**Timea Gerczei Fernandez, Scott
Pattison**



Hplc Lab Manual:

Biochemistry Laboratory Manual Mr. Rohit Manglik, 2024-07-30 Hands on manual with detailed protocols and experiments for conducting fundamental and advanced biochemistry lab work *Food Analysis Laboratory Manual* S. Suzanne Nielsen, 2010-03-20 This second edition laboratory manual was written to accompany Food Analysis Fourth Edition ISBN 978 1 4419 1477 4 by the same author The 21 laboratory exercises in the manual cover 20 of the 32 chapters in the textbook Many of the laboratory exercises have multiple sections to cover several methods of analysis for a particular food component of characteristic Most of the laboratory exercises include the following introduction reading assignment objective principle of method chemicals reagents precautions and waste disposal supplies equipment procedure data and calculations questions and references This laboratory manual is ideal for the laboratory portion of undergraduate courses in food analysis

Biochemistry Laboratory Manual For Undergraduates Timea Gerczei Fernandez, Scott Pattison, 2015-03-11 Biochemistry laboratory manual for undergraduates an inquiry based approach by Gerczei and Pattison is the first textbook on the market that uses a highly relevant model antibiotic resistance to teach seminal topics of biochemistry and molecular biology while incorporating the blossoming field of bioinformatics The novelty of this manual is the incorporation of a student driven real real life research project into the undergraduate curriculum Since students test their own mutant design even the most experienced students remain engaged with the process while the less experienced ones get their first taste of biochemistry research Inclusion of a research project does not entail a limitation this manual includes all classic biochemistry techniques such as HPLC or enzyme kinetics and is complete with numerous problem sets relating to each topic *Nielsen's Food Analysis Laboratory Manual* B. Pam Ismail, S. Suzanne Nielsen, 2024-06-20 This fourth edition laboratory manual was written to accompany Nielsen's Food Analysis Sixth Edition by the same authors New to this fourth edition of the laboratory manual are three new chapters that complement both the textbook chapters and the laboratory exercises The book again contains four introductory chapters that help prepare students for doing food analysis laboratory exercises The 26 laboratory exercises in the manual cover 24 of the 35 chapters in the textbook Many of the laboratory exercises have multiple sections to cover several methods of analysis for a particular food component or characteristic Most of the laboratory exercises include the following background reading assignment objective principle of method chemicals reagents precautions and waste disposal supplies equipment procedure data and calculations questions and references This laboratory manual is ideal for the laboratory portion of undergraduate courses in food analysis The Science of Ethanol Walter E. Goldstein, 2016-12-08 This book covers all facets involving the production and use of ethanol Topics include the optimization of raw materials energy capital process model based computer control and human resources to produce ethanol It compares and contrasts processes to prepare ethanol using biotechnology processes to prepare ethanol from chemical synthesis Matters of optimization of ethanol use as fuel fuel components are addressed based on thermodynamics kinetics and usage It

also discusses pollutants produced from ethanol and mixtures containing ethanol the status of ways to control these pollutants and what can be done to minimize the harm to the earth's ecosystems due to ethanol and gasoline reactions

HPLC Marvin C. McMaster, 2006-12-18 This Second Edition of the classic handbook details how to set up an HPLC system that capitalizes on the latest innovations It covers new techniques in high temperature micro flow and ultra fast chromatography the linking of an HPLC to a mass spectrometer and more Complete appendices and supplementary material online this guide has everything chromatographers need to know to confidently separate identify purify and quantify compounds

The Organic Chem Lab Survival Manual James W. Zubrick, 2020-02-05 Teaches students the basic techniques and equipment of the organic chemistry lab the updated new edition of the popular hands on guide The Organic Chem Lab Survival Manual helps students understand the basic techniques essential safety protocols and the standard instrumentation necessary for success in the laboratory Author James W Zubrick has been assisting students navigate organic chemistry labs for more than three decades explaining how to set up the laboratory make accurate measurements and perform safe and meaningful experiments This practical guide covers every essential area of lab knowledge from keeping detailed notes and interpreting handbooks to using equipment for chromatography and infrared spectroscopy Now in its eleventh edition this guide has been thoroughly updated to cover current laboratory practices instruments and techniques Focusing primarily on macroscale equipment and experiments chapters cover microscale jointware drying agents recrystallization distillation nuclear magnetic resonance and much more This popular textbook Familiarizes students with common lab instruments Provides guidance on basic lab skills and procedures Includes easy to follow diagrams and illustrations of lab experiments Features practical exercises and activities at the end of each chapter Provides real world examples of lab notes and instrument manuals The Organic Chem Lab Survival Manual A Student's Guide to Techniques 11th Edition is an essential resource for students new to the laboratory environment as well as those more experienced seeking to refresh their knowledge

Quality Control Training Manual Syed Imtiaz Haider, Syed Erfan Asif, 2016-04-19 Written to help companies comply with GMP GLP and validation requirements imposed by the FDA and regulatory bodies worldwide Quality Control Training Manual Comprehensive Training Guide for API Finished Pharmaceutical and Biotechnologies Laboratories presents cost effective training courses that cover how to apply advances in the life sciences to produce commercially viable biotech products and services in terms of quality safety and efficacy This book and its accompanying downloadable resources comprise detailed text summaries test papers and answers to test papers providing an administrative solution for management Provides the FDA Health Canada WHO and EMEA guidelines directly applicable to pharmaceutical laboratory related issues Offers generic formats and styles that can be customized to any organization and help management build quality into routine operations to comply with regulatory requirements Contains ready to use training courses that supply a good source of training material for experienced and inexperienced practitioners in the biotechnology biopharmaceutical

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Purification of Laboratory Chemicals W.L.F. Armarego, Christina Chai, 2009-07-23 A best seller since 1966 Purification of Laboratory Chemicals keeps engineers scientists chemists biochemists and students up to date with the purification of the chemical reagents with which they work the processes for their purification and guides reader on critical safety and hazards for the safe handling of chemicals and processes The Sixth Edition is updated and provides expanded coverage of the latest chemical products and processing techniques safety and hazards The book has been reorganised and is now fully indexed by CAS Registry Numbers Compounds are now grouped to make navigation easier and literature references for all substances and techniques have been added and ambiguous alternate names and cross references have been removed The only comprehensive chemical purification reference a market leader since 1966 Amarego delivers essential information for research and industrial chemists pharmacists and engineers it will be the most commonly used reference book in any chemical or biochemical laboratory MDPI Journal An essential lab practice and procedures manual Improves efficiency results and safety by providing critical information for day to day lab and processing work Improved clear organization and new indexing delivers accurate reliable information on processes and techniques of purification along with detailed physical properties The Sixth Edition has been reorganised and is fully indexed by CAS Registry Numbers compounds are now grouped to make navigation easier literature references for all substances and techniques have been added ambiguous alternate names and cross references removed new chemical products and processing techniques are covered hazards and safety remain central to the book

Practical Chemistry Teshome Aduugna, Girma Salale, 2024-12-30 This laboratory manual offers a broad introduction to practical instrumental analysis The practical activities include experiments for thin layer chromatography paper chromatography gas chromatography high performance liquid chromatography electrophoresis potentiometry voltammetry conductometry coulometry and electrogravimetry

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