

ESTIMATION OF CAFFEINE CONTENT FROM SOFT AND ENERGYDRINKS OBTAINED FROM REGIONAL MARKET BY UV SPECTROSCOPY AND TLC.

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Abstract: This research is for to estimate the concentration of caffeine in soft drinks and energy drinks. In pure form, caffeine is a crystalline white powder moderately soluble in water and in a wide range of organic solvent such as ethanol, ethyl acetate, methanol, dichloromethane, chloroform etc. The caffeine is determined by using UV-Visible spectroscopy method using dichloromethane as an extracting solvent at 273nm wavelength. The method was found to be fast, simple, cost effective and environmental friendly for the determination of caffeine in soft drinks with satisfactory results. Caffeine is found in many beverages such as coffee, tea, energy drinks and colas which make the drinks addictive. Caffeine content in various energy drinks and beverage varies from 10 to 50 mg of caffeine per serving; however the US Food and Drug Administration (FDA, 2006) limits the maximum amount in carbonated beverages to 6 mg/oz. Large amount of caffeine consumption can cause physiological and psychiatric dependence. The aim of this study is to determine the concentration of caffeine in soft drinks and energy drinks brands available in India to ensure whether the caffeine concentration in the follow soft drinks & energy drinks as per FDA recommendation or not. And other purpose of this research is to find erosion property of caffeine by determining buffer capacity. This research also helps to identify purity of caffeine by TLC (By measuring RF value of sample compared with standard caffeine).

Keywords: Caffeine, soft drinks & energy drinks, UV Spectroscopy, TLC.

INTRODUCTION: Caffeine is a frequently used ingredient of energy drinks. It is added as a flavoring agent and to make the drinks addictive. Caffeine is a bitter white crystalline xanthine alkaloid that acts as a psychostimulant drug and a mild diuretic. It is an alkaloid of methylxanthine family. The methylxanthines caffeine (1,3,7-trimethylxanthine), theobromine (3,7-dimethylxanthine), and theophylline (1,3-dimethylxanthine) can be normally found in coffee beans, tea leaves, mate leaves and other kinds of plants. Caffeine serves as the ingredient in many carbonated soft drinks including colas, pepper-type beverages, and citrus beverages. Pure caffeine occurs as Odorless, white, foamy mess; glistening needles of powder. Caffeine has drawn more attention in the past decade due to its physiological effects beyond that of its stimulatory effect. The Food and Drug Administration (FDA) defines caffeine as a generally recognized as safe (GRAS) substance. However, FDA specifies that the maximum amount in carbonated beverages is limited to 0.002% (FDA, 2006).^{1,2}

STRUCTURE OF CAFFEINE:



Figure no.1 Structure of caffeine

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Law's Grocer's manual James Thomas Law (of Liverpool.),1902 *A Manual of Practical Chemistry* Alexander Wynter Blyth,1879 **Advances in Usability Evaluation Part I** Marcelo M. Soares,Francesco Rebelo,2012-07-09 This volume covers the use of ergonomics modeling and on the evaluation of usability which is a critical aspect of any human technology system It will provide new training methods that enhance performance expand capabilities and optimize the fit between people and technology **Therapy Manuals for Drug Addiction** Alan J. Budney,1998 Presents clear helpful information to aid drug treatment practitioners in providing the best possible care that science has to offer *Advances in Usability Evaluation* Marcelo M. Soares,Francesco Rebelo,2012-07-09 Successful interaction with products tools and technologies depends on usable designs accommodating the needs of potential users and does not require costly training In this context Advances in Usability Evaluation Part I discusses emerging concepts theories and applications of human factors knowledge focusing on the discovery and understanding of human interaction with products and systems for their improvement The book covers devices and their interfaces focusing on optimization of user devices and emphasizing visual and haptic feedback It then discusses user studies exploring the limits and capabilities of special populations particularly the elderly which can influence the design It also examines the effect of changes in force and kinematics physiology cognitive performance in the design of consumer products tools and workplaces Examining a variety of user centered evaluation approaches the concluding chapters details methods for developing products that can improve safety and human performance and at same time the efficiency of the system It reports on usability evaluations for different kinds of products and technologies particularly for cellular phones earphones earphone controls mattresses and pillows package and professional tools and service systems The book provides new methods that enhance performance expand capabilities and optimize the fit between people and technology *Food Service Manual for Health Care Institutions* Ruby Parker Puckett,American Society for Healthcare Food Service Administrators,2004-11-08 Food Service Manual for Health Care Institutions offers a comprehensive review of the management and operation of health care food service departments This third edition of the book which has become the standard in the field of institutional and health care food service includes the most current data on the successful management of daily operations and includes information on a wide variety of topics such as leadership quality control human resource management communications and financial control and management This new edition also contains information on the practical operation of the food service department that has been greatly expanded and updated to help institutions better meet the needs of the customer and comply with the regulatory agencies standards **Laboratory Manual for the Detection of Poisons and Powerful Drugs** Wilhelm Autenrieth,1928 *Manual of Pulmonary Function Testing* Gregg Ruppel,1998 This thorough text covers the common tests and techniques related pathophysiology equipment computers and quality assurance in pulmonary function testing Used as a required text for the Pulmonary Function unit in

the respiratory curriculum its success has come out of the author's attention in every chapter and appendix to accuracy thoroughness and clinical applications Author is a current member of the AARC Clinical Practice Guidelines committee for cardiopulmonary diagnostics Symbols and Abbreviations printed inside covers can be used for quick reference in the classroom or on the job Tests are described in a step by step how to manner making this book a necessary manual for both students who are learning how to perform tests and clinicians on the job *Dietary Methodology Workshop for the Third National Health and Nutrition Examination Survey*, 1992 Four essays and a general introduction provide contemporary readings of The Grapes of Wrath for a general audience Written in an accessible style the essays cover the issues and themes of Steinbeck's politics metaphors of movement and growth views of women uses of documentary and the conversion of the novel into film The introduction provides a history of the novel's public reception a summary of the major phases of critical response and a reading of the novel as an act of returning west to Steinbeck's lost California **Hygiene: a Manual of Personal and Public Health** Sir Arthur Newsholme, 1906 **Vital and Health Statistics**, 1965 The Merck Manual Home Health Handbook Robert S. Porter, Justin L. Kaplan, Barbara P. Homeier, Richard K. Albert, 2009-10-13 The home reference guide for all health conscious readers that is packed full of essential information in an easy to read style

Laboratory Test Handbook David S. Jacobs, 1996 Contains information about laboratory procedures including test name and synonyms patient care recommendations specimen requirements reference ranges interpretive information footnotes and references This ed has expanded coverage of laboratory assays related to molecular pathology and treatments of clinical virology and therapeutic drug monitoring Dutton's Orthopaedic: Examination, Evaluation and Intervention Fourth Edition Mark Dutton, 2016-07-29 Updated edition of the 1 orthopaedic evidence based textbook and reference guide A Doody's Core Title for 2019 Dutton's Orthopaedic Examination Evaluation and Intervention provides readers with a systematic logical approach to the evaluation and intervention of the orthopedic patient In this comprehensive and up to date fourth edition Dutton strikes the perfect balance in its coverage of examination and treatment The textbook emphasizes the appropriate use of manual techniques and therapeutic exercise while outlining the correct applications of electrotherapeutic and thermal modalities as adjuncts to the rehabilitative process The content reflects the consistent unified voice of a single author a prominent practicing therapist who delivers step by step guidance on the examination of each joint and region This in depth coverage leads you logically through systems review and differential diagnosis aided by decision making algorithms features new coverage on balance and concussions New videos on testing and method techniques are available on AcessPT if adopted Also this edition has added 10 15 board review questions per chapter and has updated chapters to reflect the latest research and treatment techniques Orthopaedic Examination, Evaluation & Intervention Mark Dutton, 2004-04-16 The most comprehensive text for the core orthopaedics course required in all physical therapy programs Includes all of the necessary information to provide a high level of care to patients with any musculoskeletal dysfunction by integrating anatomy and

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