

# ESTIMATION OF CAFFEINE CONTENT FROM SOFT AND ENERGY DRINKS 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 psychiatrically 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 in taste, white crystalline xanthenes alkaloid that acts as a psychoactive stimulant drug and a mild diuretic. It is an alkaloid of methylxanthine family. The methylxanthenes caffeine (1,3,7-trimethylxanthine), theobromine (3,7-dimethylxanthine), and theophylline (1,3-dimethylxanthine) can be normally found in colanuts, coffee beans, cocoa beans, tea leaves, mate leaves and other kinds of plants. Caffeine serves as an ingredient in many carbonated soft drinks including colas, pepper-type beverages, and citrus beverages. Pure caffeine occurs as odorless, white, fleecy masses, glistening needles of powder. Caffeine has drawn more attention in the past decades 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 0.02% (FDA, 2006).<sup>(1-3)</sup>

## STRUCTURE OF CAFFEINE:



Figure no.1 Structure of caffeine

# Method Estimation Caffeine In Drinks Manual

**G Orfield**



## **Method Estimation Caffeine In Drinks Manual:**

**A Manual of Practical Chemistry** Alexander Wynter Blyth, 1879      *Law's Grocer's manual* James Thomas Law (of Liverpool.), 1902      **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      **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      **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      *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

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*Vital and Health Statistics*, 1965 **Journal of the American Dietetic Association**, 1998 Pharmaceutical Record and Weekly Market Review P. W. Bedford, 1887

**Dutton's Orthopaedic: Examination, Evaluation and Intervention, Sixth Edition** Mark Dutton, 2022-10-07 The 1 most trusted evidence based text in orthopaedic physical therapy A Doody's Core Title for 2024 2023 The definitive text for orthopedic students Dutton's *Orthopaedic Examination Evaluation and Intervention* delivers a logical systematic approach to hands on orthopedic treatment This new edition offers the perfect balance in its coverage of the continuum of care emphasizing the appropriate use of manual techniques and therapeutic exercise while outlining the correct applications of multiple adjuncts to the rehabilitative process Aided by decision making algorithms this comprehensive guide covers anatomy biomechanics examination and treatment of each joint and region and features Evidence based and written by a prominent practicing therapist this is an essential resource for physical therapy students and practitioners Features 1 200 photos and illustrations depict orthopaedic techniques NEW videos on testing and method techniques available on AccessPhysiotherapy NEW information on balance pain assessment gait and concussions Incorporates the APTA Practice Patterns to address certain dysfunctions

**Drug Information Handbook** Charles Lacy, 2000 The Dhaka University Journal of Science, 2007

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