

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

Method Estimation Caffeine In Drinks Manual

Mira Skylark, AI

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 **Caffeine Dependence** Mira Skylark, AI, 2025-03-12 Caffeine Dependence explores the significant impact of caffeine on our daily lives examining its effects on energy levels mood regulation and overall well being Many individuals rely on caffeine to kickstart their day or combat afternoon slumps often unaware of the underlying dependence The book highlights how caffeine a widely consumed psychoactive substance affects both physical and psychological states making it challenging to function without it Understanding these mechanisms is key to mindfully managing intake The book traces caffeine s journey from ancient rituals to modern day ubiquity revealing how it has become deeply embedded in our routines It delves into caffeine s chemical properties physiological effects and psychological dimensions of dependence including its impact on mood anxiety and sleep patterns The book further analyzes withdrawal symptoms such as headaches and fatigue and explores factors influencing their severity Drawing from scientific studies and personal accounts Caffeine Dependence adopts a fact based approach presenting complex concepts in an accessible manner The book progresses logically starting with caffeine s effects on the body and mind moving to the science of withdrawal and culminating in practical strategies for managing consumption These strategies include tapering methods alternative energy sources and lifestyle adjustments Readers will gain practical knowledge to identify dependence manage withdrawal and make informed decisions about their caffeine habits empowering them to take control of their consumption

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 **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 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

Stormwater Effects Handbook G. Allen Burton Jr.,Robert Pitt,2001-08-29 A stand alone working document Stormwater Effects Handbook A Toolbox for Watershed Managers Scientists and Engineers assists scientists and regulators in determining when stormwater runoff causes adverse effects in receiving waters This complicated task requires an integrated assessment approach that focuses on sampling before during and aft Journal of Studies on Alcohol ,1980 The contents alternate monthly original articles in odd numbered months current literature in even numbered months 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 **Vital and Health Statistics** ,1965 Quarterly Journal of Studies on Alcohol ,1980 Includes sections Activities of the Research Council on Problems of Alcohol and Current literature 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 biomechanics with treatment strategies Features case studies extensive illustrations and guidelines from the American Physical Therapy Association APTA which are integrated throughout

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