

# 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 xanthines alkaloid that acts as a psychoactive stimulant 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 colas nuts, 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>[1,2]</sup>

## STRUCTURE OF CAFFEINE:



Figure no.1 Structure of caffeine

# Method Estimation Caffeine In Drinks Manual

**Gregg Ruppel**



## **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**

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*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 after *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 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

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## Unveiling the Power of Verbal Art: An Mental Sojourn through **Method Estimation Caffeine In Drinks Manual**

In a global inundated with displays and the cacophony of quick connection, the profound power and mental resonance of verbal artistry often disappear in to obscurity, eclipsed by the regular assault of sound and distractions. Yet, located within the lyrical pages of **Method Estimation Caffeine In Drinks Manual**, a captivating work of fictional elegance that impulses with raw feelings, lies an unique journey waiting to be embarked upon. Written by a virtuoso wordsmith, that mesmerizing opus courses viewers on an emotional odyssey, softly exposing the latent potential and profound affect stuck within the delicate internet of language. Within the heart-wrenching expanse of this evocative evaluation, we can embark upon an introspective exploration of the book is main subjects, dissect its fascinating writing type, and immerse ourselves in the indelible impression it leaves upon the depths of readers souls.

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web the most commonly used electrical blueprint symbols including plug outlets switches lights and other special symbols such as door bells and smoke detectors are shown in the figure below note explanations for common household electrical items such as three way switches and switched duplex plug outlets are below the figure notes