

# 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 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

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

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### Table of Contents **Method Estimation Caffeine In Drinks Manual**

1. Understanding the eBook **Method Estimation Caffeine In Drinks Manual**
  - The Rise of Digital Reading **Method Estimation Caffeine In Drinks Manual**
  - Advantages of eBooks Over Traditional Books
2. Identifying **Method Estimation Caffeine In Drinks Manual**
  - Exploring Different Genres
  - Considering Fiction vs. Non-Fiction
  - Determining Your Reading Goals
3. Choosing the Right eBook Platform
  - Popular eBook Platforms
  - Features to Look for in an **Method Estimation Caffeine In Drinks Manual**
  - User-Friendly Interface
4. Exploring eBook Recommendations from **Method Estimation Caffeine In Drinks Manual**
  - Personalized Recommendations
  - **Method Estimation Caffeine In Drinks Manual** User Reviews and Ratings
  - **Method Estimation Caffeine In Drinks Manual** and Bestseller Lists

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7. Enhancing Your Reading Experience
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  - Highlighting and Note-Taking Method Estimation Caffeine In Drinks Manual
  - Interactive Elements Method Estimation Caffeine In Drinks Manual
8. Staying Engaged with Method Estimation Caffeine In Drinks Manual
  - Joining Online Reading Communities
  - Participating in Virtual Book Clubs
  - Following Authors and Publishers Method Estimation Caffeine In Drinks Manual
9. Balancing eBooks and Physical Books Method Estimation Caffeine In Drinks Manual
  - Benefits of a Digital Library
  - Creating a Diverse Reading Collection Method Estimation Caffeine In Drinks Manual
10. Overcoming Reading Challenges
  - Dealing with Digital Eye Strain
  - Minimizing Distractions
  - Managing Screen Time
11. Cultivating a Reading Routine Method Estimation Caffeine In Drinks Manual
  - Setting Reading Goals Method Estimation Caffeine In Drinks Manual
  - Carving Out Dedicated Reading Time
12. Sourcing Reliable Information of Method Estimation Caffeine In Drinks Manual
  - Fact-Checking eBook Content of Method Estimation Caffeine In Drinks Manual
  - Distinguishing Credible Sources
13. Promoting Lifelong Learning

- Utilizing eBooks for Skill Development
- Exploring Educational eBooks

### 14. Embracing eBook Trends

- Integration of Multimedia Elements
- Interactive and Gamified eBooks

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