

# 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

# Method Estimation Caffeine In Drinks Manual

**Yi-Tong Ma**



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web the heart of fourier analysis is an object known as the dirac delta function denoted as  $\delta(x)$  informally it is simply a function which is zero for  $x \neq 0$  and in nite at  $x = 0$  such that  $\int_{-\infty}^{\infty} \delta(x) dx = 1$  de nition and properties to de ne this more formally consider the function  $d(x)$  de ned by the following integral  $d(x) = \frac{1}{2\pi} \int_{-\infty}^{\infty} e^{ikx} dk$

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web fourier analysis is fundamental to understanding the behavior of signals and systems this is a result of the fact that sinusoids are eigenfunctions section 14 5 of linear time invariant lti section 2 2 systems

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web the fourier theorem named after the french mathematician jean baptiste joseph fourier states that any repetitive waveform can be represented as a collection of sine and cosine waves of the proper amplitude and frequency

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web in physics engineering and mathematics the fourier transform ft is an integral transform that converts a function into a form that describes the frequencies present in the original function the output of the transform is a complex valued function of frequency