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PHYSICOCHEMICAL ANALYSIS OF PT.ET. EXTRACTED LYCOPENE AND VISCOSITY, SURFACE TENSION CHARACTERIZATION BY MANSINGH SURVISMETER

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ABSTRACT

The Physico-chemical characterization of Lycopene by applied analysis methods such as Absorbance, pH, Viscosity and Surface Tension, Lycopene is a lipid molecules substrate present in vegetables fruits for responsible to red color appeared with nutritional and medicinal properties, mostly used in skin cancer and Lycopene is protective in several chronic diseases and also Lycopene have phytochemical properties, that's way determined to applied parameter values. Qauntities of Lycopene in samples CS1, AS2 to 0.042783 and 0.016227 in mg/100gm, viscosity of CS1, AS2 to 0.400467 $N.sm^{-2}$ and 0.371466 $N.sm^{-2}$ and surface tension of CS1, AS2 to 20.59763$N.m^{-1}$ and 22.87903 $N.m^{-1}$ and the pH values was CS1 of 6.25, AS2 of 6.60 and pure PtEt of 6.77.

Keywords: PtEt, Lycopene, pH, Absorbance, Viscosity, Surface Tension.

INTRODUCTION

The Lycopene has looked at its effect on cancer, there is growing evidence that Lycopene is protective in several chronic diseases including cardiovascular disease [1-2]. Lycopene belongs to the family of carotenoids. It has a structure that consists of a long chain of conjugated double bonds, with two open end rings. The structure Lycopene is the longest of all carotenoids. The Lycopene ([$C_{40}H_{56}$], MW 536.85) is an unsaturated hydrocarbon carotenoid containing 13 C=C bonds, 11 of which are conjugated and arranged in a linear array. These conjugated double bonds are responsible for the vibrant red color of Lycopene [3]. Lycopene the red pigment of the tomato is a C_{40} carotenoid made up of eight Isoprene

unit making it a tetraterpene β- carotene the yellow pigment of the carrot is an isomer of Lycopene in which the double bond at C_1-C_2 and $^*C_1$- $^*C_2$ are replaced by bond extending from C_1 to C_6 and from $^*C_1$ to $^*C_6$ from rings, and also constituent of the tomatoes' This is the first step in the overall visual cycle associated with night vision. Lycopene is a vibrant red carotenoid that serves as an intermediate for the biosynthesis of other carotenoids and is found in moderate to high concentrations in such foods as tomato, watermelon, red grapefruit, and Brazilian guava etc [4]. The major coloring principle of Lycopene extract from tomato is all-*trans*-lycopene, products consists predominantly of all-*trans*-lycopene 35-96% of the total lycopene content and low levels of *cis*-lycopenes 1-22% of the total lycopene content [5]. Like its biosynthetic derivatives such as β-carotene, Lycopene free radical scavenger [6] and its presence in the diet positively correlates with reduced cancer incidence [7-10]. Conventional spectrometer assays employ a release of Lycopene from tissue with polar organic solvents followed by extraction of released Lycopene into a nonpolar solvent [11]. In a fallow up lab will examine the UV-Vis.spectrum of Lycopene isomerizes it and then examine the isomerize spectrum for comparison [12]. Lycopene extract from tomato is a dark-red viscous liquid. It is freely soluble in acetone and PtEt (Petroleum Ether) and partially soluble in ethanol and acetone, and insoluble in water. Spectroscopy was used for quantification of Lycopene in tomato varieties [13-14].

Research Methodology [15]**.**

Collection of Sample: Two types the tomatoes were purchased from a store so variety name were not available of the tomatoes used look like cherry (CS1) and aroma (AS2) types.

Sample Preparation: 100gm of the tomatoes fruit tissue was cut in to small pieces approximately 2-3cm cubes and homogenized with Acetone using mortar and pestle until the residue is color less. Pool the Acetone extract and transfer in a separating funnel containing about 20ml PtEt and mix gently. Add about 20ml of 5% $NaSO_4$ solution and shake the separating funnel gently. PtEt to the separating funnel for clear separation of two phases most of the colors will be noticed in appear PtEt phase and re-extract the lower aqueous phases with additional 20ml PtEt until the aqueous phases is colorless. That's way the total volume of extracted lycopene at 40ml its storage in freeze for long time to use.

pH Values of Extracted Lycopene: the pH values played an important role determine the potential numbers of hydrogen of anhydrous liquid samples. The samples of PtEt extracted lycopene know pH values at 20˚C by using pH meter.

Absorbance of Extracted Lycopene: Make up the volume and measure the Absorbance by spectrophotometer at 503nm (λ) using PtEt as blank [16] The carotenoid in the sample are extracted in Acetone and then taken up in the PtEt lycopene has absorption maxima at 503nm (λ) one mole at lycopene when dissolve in one little light PtEt 40-60ºC and measured in a spectrophotometer at 503nm (λ) to 1cm light path gives on absorbance of $17.2x10^4$ /M×cm. There for a concentration of 3.1206µg lycopene/ml or Lycopene in mg/100gm= A_{503} * 3.1206 / wt of sample [17-18]

Determine the Viscosity and surface tension of Extracted Lycopene by BMS: **[19]**

The survismeter is an instrument for determining viscosity, surface tension and other parameters more than twenty five may be characterizing of various types of liquids. First maintained temperate of systems at 15-20˚C and filled 30ml PtEt extracted Lycopene is in bulb of viscosity meter up to the given mark with the help of syringe after that note the time of viscosity of PtEt through the stopwatch after that know surface tension 30ml PtEt extracted Lycopene samples was filled in bulb of Stalagmometer up to the given mark with the help of syringe after that note the PDN details showing in figure 3 & 4. For Viscosity $\eta = \eta_0(t/t_0 \times \rho/\rho_0)$ and Surface Tension $\gamma=\gamma_0(n_0/n \times \rho/\rho_0)$

RESULTS AND DISCUSSION

The Tomatoes fruits contained Lycopene extract in PtEt were quantities determined by using UV-Vis spectrophotometer at 503nm wavelength the CS1 has Lycopene 0.042783mg/100gm and another AS2 of 0.016227mg /100gm in which CS1 have more then quantities compared to AS2 now we determined the some physicochemical parameters such as viscosity and surface tension by BMS where viscosity of CS1 at 0.400467 $N.sm^{-2}$, and AS2 at 0.371466 $N.sm^{-2}$ and where Surface tension gives them their near-spherical shape, because a sphere has the smallest possible of CS1 at 20.59763 $N.m^{-1}$, AS2 at 22.87903 $N.m^{-1}$ the surface tension of samples CS1< AS2 and pH values has compared between pure PtEt of 6.77 and both PtEt extracted Lycopene from Tomatoes was of CS1 at 6.25, AS2 at 6.60 on temperature at 20˚C.

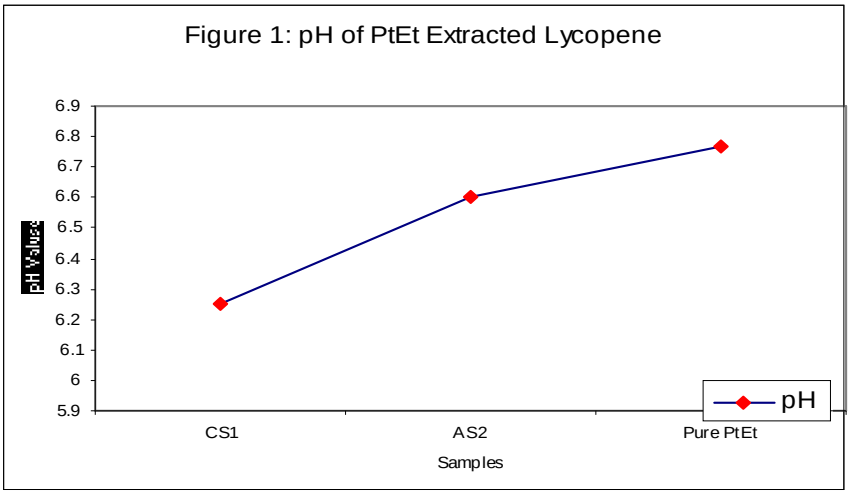


Figure 1: pH of PtEt Extracted Lycopene
6.9
6.8
6.7
6.6
6.5
6.4
6.3
6.2
6.1
6
5.9
pH Value
CS1
AS2
Pure PtEt
Samples
pH

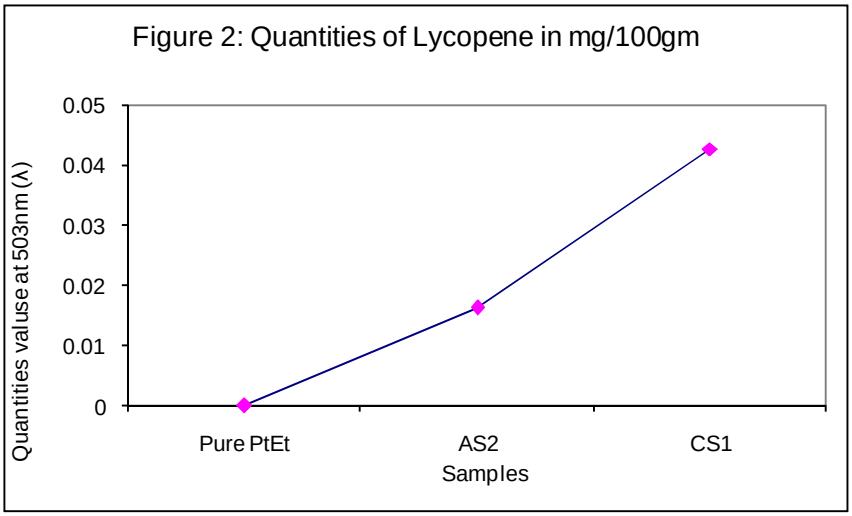


Figure 2: Quantities of Lycopene in mg/100gm
0.05
0.04
0.03
0.02
0.01
0
Quantities value at 503nm (λ)
Pure PtEt
AS2
CS1
Samples

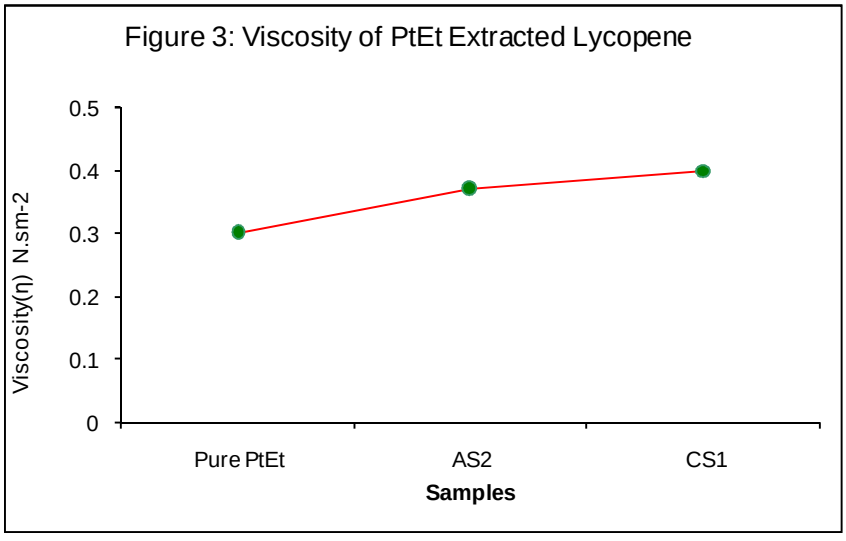
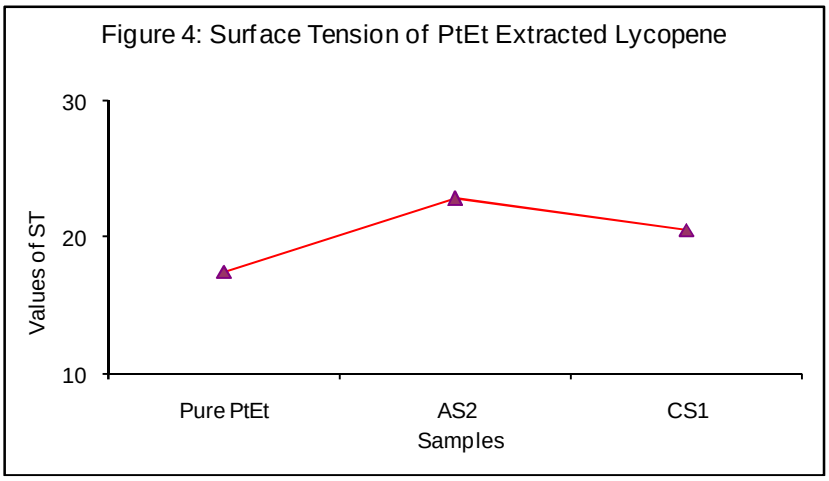


Figure 3: Viscosity of PtEt Extracted Lycopene
0.5
0.4
0.3
0.2
0.1
0
Viscosity(η) N.sm-2
Pure PtEt
AS2
CS1
Samples



CONCLUSION

The Lycopene molecule has an anticancer properties and much probability to reduced cancers. When we are intake some varieties of tomatoes such as in foods materials without cooking in which Lycopene present but when we are cooked its then heat temperature may be degrade to Lycopene quantities [20]. According to these researches report the cherry type tomato has much quantities of Lycopene compared to others variety of tomatoes.

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