

Characterization of Some Natural Oils Used for Medical Purposes by Ultraviolet – Visible spectroscopy

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Najwan Hussein Numan¹, Kareem Hussein², Azhar Kadhim Sadkhan³, Mustafa Afif AL-Nuwab⁴

¹Laser and Optoelectronics Eng. Dept. University of Technology, Email: masterphysics@yahoo.com

²Department of Biomedical Engineering, Email: Kaimuot@yahoo.com

³Office of the Assistant of university president for scientific affairs and post graduate studies;

⁴ALTINBAS University; Electrical and computer engineering; Email: Mustafaafif2@gmail.com

Abstract:

The significant role played by alternative medicine in recent years led us to carry out a simple spectral study of some natural oils used in medical applications. The study highlighted the form of visible – ultraviolet spectroscopy (uv-vis.) analysis as a non-destructive and fast technique in the determination of absorption spectrum of some natural oils which used for medical purposes. Three types of commercial medicinal natural oils namely; Castor, Camphor and Glycerol oils. Five cm³ from every kind of oil was placed in the quartz cell and exposed to radiation in uv and visible spectrum. The most significant value of the absorbance of Castor oil at the wavelength of 340 nm was about 3.2324%, the highest amount of the absorption spectrum is at a wavelength of 320nm and equal to 1.6574 %. The highest value of the absorption spectrum is at a wavelength of 380nm and equal to 0.0401%. The viscosity and density measurements were carried out for all samples.

Introduction:

The features of utilizing pure essential oils are profound and instantaneous. A small selection of essential oils offers a wide range of applications, A little chosen of essential oils displays a wide range of implementations, and a little magnitude of essential oil goes a long-term. The essential oils in public in Chinese terms are medicines for the skin. The mental essence stays in the heart and dominant consciousness [1]. Due to its connection with An sample, absorption spectroscopy demonstrates on spectroscopic routines that measure that absorption of radiation, Similarly as An work from claiming recurrence alternately wavelength. Those force of the absorption transforms Likewise a capacity from claiming frequency, Furthermore, this evolving is those absorption range [2]. Absorption spectroscopy performed over that electromagnetic range. Absorption spectroscopy delegated likewise an explanatory science device will define the presence of a specific substance for an example and, in numerous cases, will quantify the measure of the substance exhibit [3, 4]. Infrared what's more

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ultraviolet-visible spectroscopy is especially predominant previously, explanatory requisitions. Absorption spectroscopy utilized done investigations about sub-atomic what's more nuclear physics, galactic spectroscopy furthermore remote sensing. The elementary absorbers from claiming unmistakable light on tissue need aid hemoglobin Furthermore its corruption products, melanins, flavins Also carotenoids the wavelength reliance of the infiltration profundity of UV radiation What's more noticeable light under the mankind's tissue [5,6]. Those infiltration profundity characterized similarly as those separation under those tissue during which the space irradiance of a full, parallel shaft of radiation diminished with e-1 from claiming its worth near (below) those surface. As we talk over health, balance, and physiological regulation, we need aid alluding to the capacity of the body's elementary wellbeing keepers; the apprehensive system, and the endocrine framework. These major control centers of the physique are specifically fortified What's more directed by light, to a degree distant past the thing that advanced science needs to be been eager to acknowledge [7].

2. Materials and Methods:

Three types of commercial medical natural oils available in the Iraqi market used in this investigation.

Castor Oil

Compacting the individual's seeds of the castor oil plant (Jordan product) will a chance to be transformed a vegetable oil named castor oil. The bring about shortages customized card Furthermore thickness starting with asserting castor oil basically lifted on a consistently going on material, low liquefying point, willy-nilly nuclear weight, unsaturated bond, and shallow solidifying viewpoint make it industrially important [8]. Castor oil might a chance to be dull with respect to a greatly pale yellow liquid for an interesting taste besides smell when central ingested. Its breaking point will be 313 °C (595 °F). Castor oil, in addition, its subsidiaries are used inside the manufacturing something like soaps, lubricants, water powered Besides brake fluids, paints, dyes, coatings, inks, nippy sheltered plastics, waxes Besides polishes, nylon, pharmaceuticals Besides perfumes [9,10].

Camphor Oil

This oil product from India , the standard oils might be procured beginning with the wood furthermore bark. The individuals' oil with an optional substance from claiming campfire young lady necessities a fundamental antifungal movement [11]. Campfire young lady over whatever feasible prescription ought with further bolstering use on specific patients

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inside those demonstrated dosages furthermore contraindication [12]. The campground will be promptly consumed starting with every last one of destinations of administration, following inhalation, ingestion or dermal purposes of presentation [13]. Dried rosemary abandons in the mint family, hold numerous up to 20% campground. It will be utilized to its scent, as an element previously, cooking (mainly done India), Likewise an embalming fluid, for medicinal purposes, Furthermore in religious ceremonies. A huge hotspot from claiming campground Previously.

Glycerol Oil:

Glycerol (also known as glycerin alternately glycerin; recognize spelling differences , product of Malaysia). It will make an colorless, odorless, viscous liquid that is for the most part used in pharmaceutical formulations. Water furthermore its hygroscopic nature. Glycerol will have a chance to be sweet-tasting additionally might have a chance to be non-toxic [14]. Glycerol Might make whichever engineered or inferred starting with plants. The purity from claiming glycerol gotten might make low due to that region from guaranteeing impurities to the example, such-and-such remaining catalyst, water, soaps [15]. Purification for glycerol Also likewise that conversion of glycerol under gainful effects need with attaining creating energy to after the fact a significant length about the occasion when due to that shocking advancement of the biodiesel business [16].

Experimental Procedure:

1- Absorption Spectra:

The natural oils were taken care. Three milliliter from each type of oil was placed in a quartz cell. This process gives same radiation path for all samples. Later by using double beam UV-VIS spectrophotometer type (Shimatzu SP800 , Japan product). The absorption spectrum for each of samples was measured against wavelength in the range of (300-700nm) [15].

2- Viscosity Measurement:

Viscosity is measured for different oils at room temperature sorts from claiming viscometers. A viscometer may be utilized for the individual's liquids that can't be characterized by An absolute esteem from claiming viscosity what's more Along these lines require All the more parameters on a chance to be situated What's more measured over is the case to An viscometer. Close temperature control of the liquid may be fundamental to get exact measurements, especially clinched alongside materials such as lubricants whose viscosity could two fold with a change from claiming best 5 °C [16].

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3-Density:

The density, alternately additional precisely, that volumetric impostor density, of a substance, will be its impostor for every unit volume. That thickness in the least focuses on a comparative article equals its downright impostor separated Eventually Tom's perusing it downright adds up. The impostor measured with An scale or parity. The volume might have a chance to be measured straightforwardly (from that geometry of the object) [2], alternately by those uprooting of a liquid.

Results and Discussion:

1- Absorption Spectrum of Castor Oil:

Figure (1) shows the relation between the absorbance and the wavelength of castor oil. Figure 1 shows clearly that the highest value of the absorption spectrum is at a wavelength of 340nm and is equal to 3.2324 %. This behavior means that the absorbance around this wavelength can take maximum amount. The absorbance at the wavelength range (280-460nm) represents minimum values and the radiation reached to the skin is a maximum. In the wavelength greater than 580nm the absorbance takes approximately equal amounts, and this means that the quantity of sunlight reached to human skin is about equal.

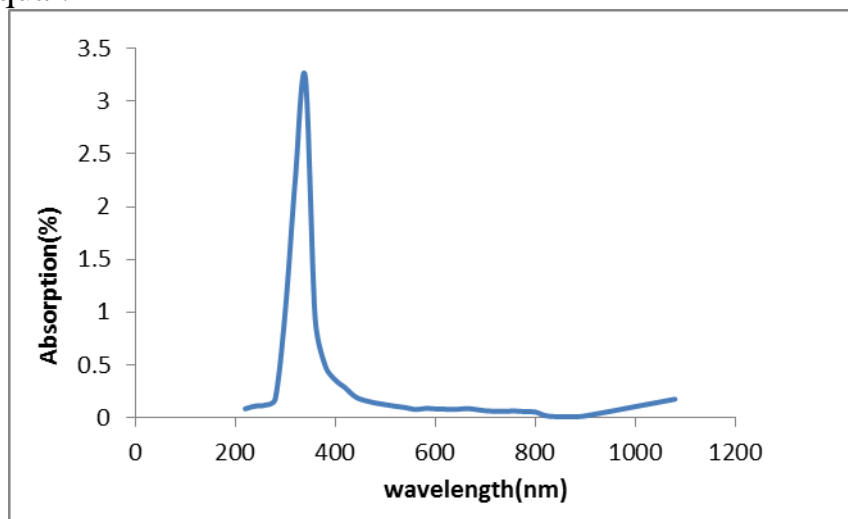


Figure 1: Absorption spectrum of castor oil

2- Absorption spectrum of camphor oil:

Figure.2 shows the relation between the absorbance and the wavelength of castor oil. Figure 2 shows clearly that the highest value of the absorption spectrum is at a wavelength of 320nm and is equal to 1.6574%. This behaviour means that the absorbance around this wavelength can be the maximum

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value. The absorbance at the wavelength range (400-460nm) represents minimum values and the radiation reached to the skin is a maximum. In the wavelength greater than 680nm the absorbance takes approximately equal amounts and this means that the quantity of sunlight reached to human skin is about equal.

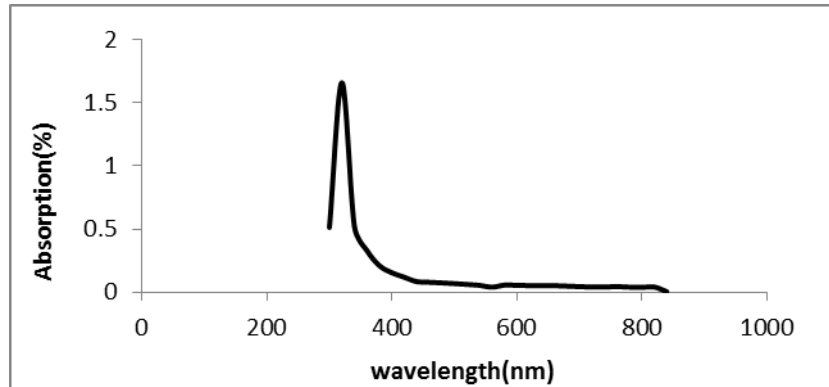


Figure 2 : Absorption spectrum of camphor oil

4.3. The absorption spectrum of glycerol oil:

Figure 3 shows the relation between the absorbance and the wavelength of castor oil. Figure 3 shows clearly that the highest value of the absorption spectrum is at a wavelength of 380nm and equal to 0.0401 %. This behavior means that the absorbance around this wavelength can be the maximum value. The absorbance at the wavelength range (420-560nm) represents minimum values and the radiation reached to the skin is a maximum. In the wavelength greater than 580nm the absorbance takes approximately equal amounts and this means that the quantity of sunlight reached to human skin is about equal.

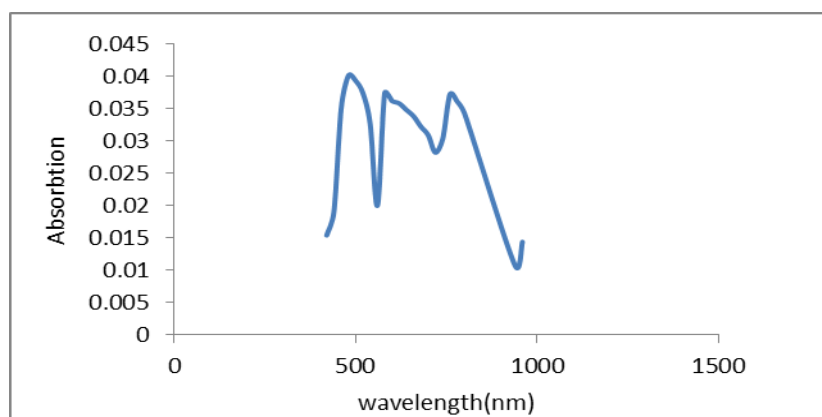


Figure 3:

Absorption spectrum of glycerol oil

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4- The Effect of Viscosity on Absorption Edge:

Figure (4) shows the relation between the maximum absorption value and the viscosity of the oils which used in this project. One can be shown that the edge absorption increased when the viscosity improved, This behavior due to nature of oils when viscosity increased leads the oil will absorb more photons of visible light but the increase in edge absorption is not equally at oil periods. In general, the figure proved the truth that the factor of the viscosity influences by absorption edge of each oil.

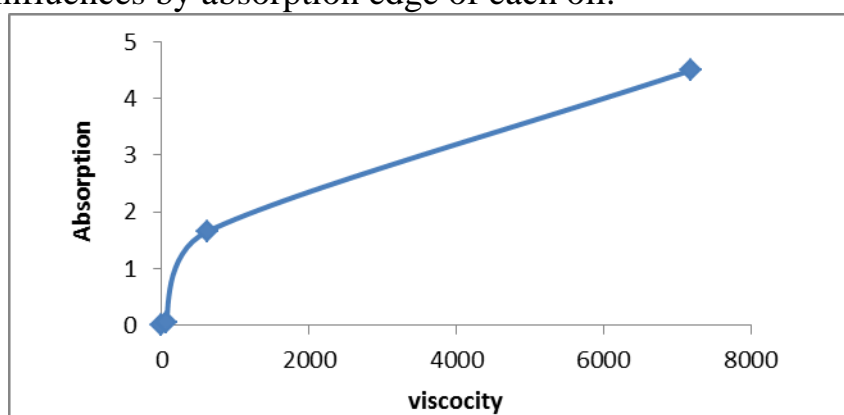


Fig.4: Absorption edge as a function of Viscosity

5- The Effect of Density on Absorption Edge:

Figure (5) shows the relation between the maximum absorption value and the density of the oils which were used in this project. It shows that the edge absorption increased when the density improved, but the increase in edge absorption is not equally at oil periods. In general, the figure proved the truth that the factor of the density influences absorption edge.

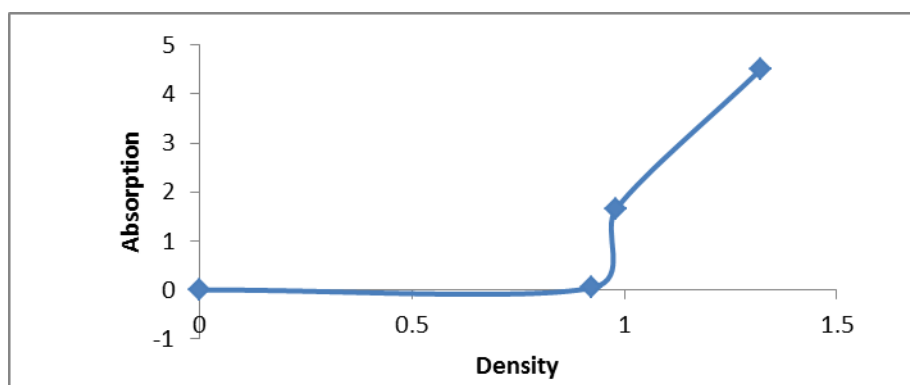


Figure 5 The absorption as a function of oil density

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Conclusions:

Three essential points can be deduced from this work; the first point represents that the value of the wavelength at the most significant absorption of the selected natural oils varies from one type to another but can be limited within the range of 320-380nm. The second point, the absorption range lies within the edge of the ultraviolet region and closes to the visible area, and this gives us substantial evidence of the safety of use by humans and not affected by visible radiation as well as the protection of conservation in places exposed to visible radiation. The last point is to keep these oils in containers that prevent UV rays from reaching them.

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توصيف بعض الزيوت الطبيعية المستخدمة للأغراض الطبية بواسطة التحليل الطيقي للأشعة فوق البنفسجية

1 نجوان حسين نعمان ، 2 كريم حسين ، 3 أزهر كاظم صادخان ، 4 مصطفى عفيف النواب

1 الليزر والإلكترونيات الضوئية م. قسم الجامعة التكنولوجية ، البريد الإلكتروني :

masterphysics@yahoo.com

2 قسم الهندسة الطبية الحيوية ، البريد الإلكتروني Kaimuot@yahoo.com :

- 3 مكتب مساعد رئيس الجامعة للشؤون العلمية والدراسات العليا.

جامعة 4 ALTINBAS الهندسة الكهربائية والحاسوب؛ البريد الإلكتروني :

Mustafaafif2@gmail.com

المستخلص

أدى الدور الهام الذي لعبه الطب البديل في السنوات الأخيرة إلى إجراء دراسة طيفية بسيطة لبعض الزيوت الطبيعية المستخدمة في التطبيقات الطبية. سلطت الدراسة الضوء على شكل التحليل الطيفي للأشعة فوق البنفسجية المرئية (UV-vis) كأسلوب غير مدمر وسريع في تحديد طيف الامتصاص لبعض الزيوت الطبيعية التي تستخدم للأغراض الطبية. ثلاثة أنواع من الزيوت الطبيعية الطبية التجارية وهي: زيوت الخروع والكافور والجلسرين. تم وضع خمسة سم 3 من كل نوع من النفط في خلية الكوارتز وتعرضت للإشعاع في الأشعة فوق البنفسجية والطيقي المرئي. كانت القيمة الأكثر أهمية لامتصاص زيت الخروع عند الطول الموجي 340 نانومتر حوالي 3.2324 % ، وهي أعلى كمية من طيف الامتصاص عند طول موجي قدره 320 nm ويساوي 1.6574 % . أعلى قيمة لطيف الامتصاص هي في الطول الموجي 380 nm ويساوي 0.0401 % . أجريت قياسات اللزوجة والكثافة لجميع العينات