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Research paper

Relative optical transmittance of aqueous extracts of the middle layer of the fruits of the Nile acacia plant

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Abstract

This study dealt with determining the relative optical transmittance of aqueous extracts of Nile acacia fruitsThis is after preparing aqueous extracts at certain concentrations after dilution operations to determine the first concentration, and the concentration was set at 100 Celsius, and the permeability was measured using a Spectrophotometer deviceWith a wavelength of 600 nanometers for yellow or brownish solutions, transmittance is estimated using optical measurements of aqueous extracts of the sample. It blocks and reflects the light passing through it with the concentration of the sample in the extract. The light that is absorbed or reflected through the solution is directly proportional to the sample concentration, i.e. the light that passes through it is proportional. Inversely with the concentration of the sample in the solutionAfter measuring the intensity of light transmitting from the device, we performed other mathematical operations to find the relative optical transmittance, which was very high at 99.75%. This indicates that the solution is regular and that the ions or particles that make it up transmit light through it.

Keywords: *Light; Light Reflection; Light Absorption; Wavelength; Concentration.*

1. Introduction

Transmittance is known as the measurement of light passing through materials through which you can learn its quantity. It is a unit of measurement that depends on sight and measures the possibility of transmitting materials or transmitting light. Transmittance depends on the reflection of light [2] Transmittance has many benefits, including knowing its effects on some particles, such as the alpha particle, through CR-39 detectors, while saving time and effort [4]. Its aesthetic effect on porcelain, which is controlled by the chemical composition of porcelain with high temperature [7]. Also, the transmittance in the lighting panel is very good, transmitting light. [9]. IncludingWe can define transmittance according to spectroscopy, the path of some incident light ray in the presence of a known wavelength through the sample, which is considered an ideal condition. But usually the ray loses part of it inside the sample because it is absorbed by it, and it weakens with the passage of time. The ray that is not absorbed comes out of it, so the concept of transmittance and absorption is related to some [10] [2]. Water is also absorbedPart of the electromagnetic spectrum when radiation is transmitted contains water molecules and thus absorbs water [2] [12] [5] [12].

2. Statistical analysis

T=T1÷T0
T:Optical transmittance
T1:The intensity of the transmitted beam
T0:The intensity of the incident beam
T1=599.85nm
T0=600nm
T=599.85 ÷ 600=0.9975
Ts=T×100=0.9975×100=99.75%
Ts:Relative permeability
a=1-T =1-0.9975=0.0025 nm
a: Optical absorbance

3. Materials and methods

25 grams of sample
Distilled water

Filter papers
250ml flasks and 1000ml flasks
Measuring cylinder
Filtration depth
Sensitive balance
spoon
Spectrophotometer
It was extracted by soaking, where we soaked 25 grams in a liter of distilled water at normal room temperature for a period of 24 hours, then we filtered the solution, took 100 ml of it, and took 2 ml of itHow the device works.
When it is connected and the appropriate wavelength of 600 nm is determined, the plank is placed, it is read and the result is recorded, after which the device whistles, and accordingly the extract is placed in the test tube at an angle of 90 degrees through which the incident radiation passes, and the reflected radiation is measured and a compensation is made in the transmittance equation.

4. Results

Table: Shows the Ratios for Absorbance and Standard and Relative Transmittance

Testing	Solution volume /mm	Incident light /nm	Transmitting light/nm	Absorbency/cm-1	Standard /permeabilitnm	Relative permeability
Aqueou extract	2	600	599.85	0.0025	0.9974	99.75%

5. Discussions

After the study we conducted, we found the transmittance of the extract to be very high. This means that the solution is a regular solution and that the ions that make up the solution conduct light, meaning they allow light to pass through it. Through the results of the study, we can prove that the optical transmittance is inversely proportional to the optical absorbance.This study is consistent with the Beer-Lamber Law, which explained the relationship between absorbed light and the properties of the material through which the light passes [1] [6].and.

6. Conclusion

The extract under study exhibits exceptionally high permeability, indicating minimal absorbance. It behaves as a regular solution, with its constituent ions facilitating the transmission of light. Consequently, the conditions of Beer's Law are fully satisfied.

Recommendations

After the results shown by the study on the extract of the second layer of indigo acacia fruits, we recommend conducting many studies to learn many of its properties.

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