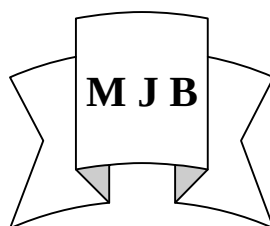


The Study of the effect of Helium – Neon Laser irradiation on the Albumin

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Abstract

The aim of this research is to counting the absorption coefficient for several concentrations of Albumin solution (0.25 , 0.5 , 0.75 , 1 , 1.25 gm/100ml) before and after exposure to Helium – Neon laser irradiation with wave length (632.8 nm) by light capacity (2 MW) which occurs within visible area (400 – 700 nm) by (Spectrophotometer.PD-303) , it is also accounted the coefficient absorption for low concentration (0.25 , 0.5 , 0.75 , gm/100ml) according to Beer - Lambert Law regarding the effect of Hydrogen bonding on coefficient of absorption whenever time increases.

الخلاصة

0.25 , 0.5 , 0.75 , 1 , 1.25 gm / 100 ml) الهدف من البحث حساب معامل الامتصاص لعدد من تراكيز محلول الألبومين قبل وبعد التعرض الى أشعة ليزر هيليوم – نيون (Helium – Neon) ذات الطول الموجي (632.8nm) وبالقعدة الضوئية (2 MW) كما تم حساب معامل Spectrophotometer. PD-303 بواسطة جهاز المطياف (400 – 700 – nm) والواقع ضمن المنطقة المرئية (400 – 700 – nm) مع الأخذ بنظر Beer - Lambert) حسب قانون بير لامبرت (0.25 , 0.5 , 0.75 gm/100 ml) الامتصاص للتراكيز الواطنة الاعتبار تأثير التآصر الهيدروجيني على معامل الامتصاص كلما ازداد الزمن .

INTRODUCTION

Albumin : the molecular weight of Bovine serum Albumin (BSA) has been published at 66,120 [1] . or 66,267 [2] . but it was revised in 1990 to 66,430 [3] . All three values are based on amino acid sequence information available at the time. Albumins are a group of acidic proteins which occur in the body fluids seeds. Serum and plasma albumin is carbohydrate free and comprises 55-62 % of the total albumin in the body in the circulating plasma at one time with the rem which there is , in general , equilibration about every 24 hours

Bovine albumin is a single poly peptide chain consisting of approximately 583 to 595 at PH 5-7 it contains 17 intrachain disulfide bridges and 1 sulfhydryl group. [4]

Laser Helium-Neon was studying the effect of irradiation on the Molecular Albumin, and the relationship between Laser irradiation and Absorption of monochromatic Light.

Absorption : The absorbance of a medium is defined as the ratio of absorbed and incident intensities .

Absorption is due to a partial conversion of Light energy into heat motion or certain vibration of molecules of the absorbing material. The ability of medium to absorb radiation depends on a number of factors , mainly the electronic constitution of its atoms and molecules, the wave length of radiation , the thickness of absorbing layer and internal parameters such as the temperature of the concentration of absorbing agents.

Absorption of monochromatic light. It can be expressed by the formula , known by Beer - Lambert Law: [5]

$$I = I_0 e^{-cb}$$

I : transmitted Light

I₀ : Incident Light

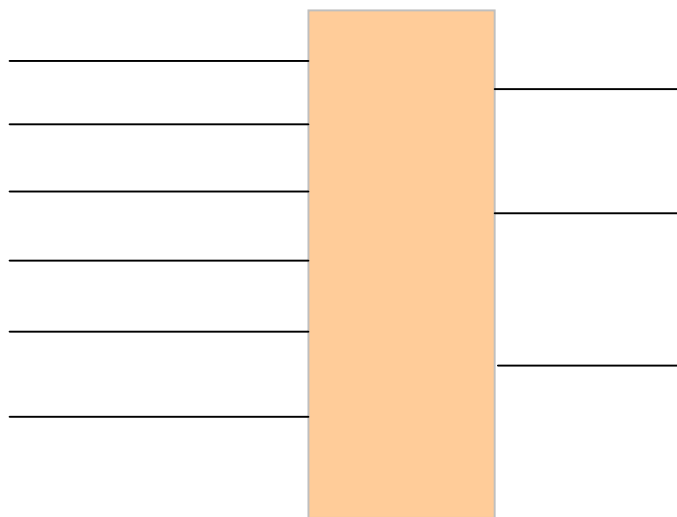
C : concentration

b : thickness

: Absorption Coefficient

Absorbance expressed in optical density (O.D) , absorbed by the substance , according to the relationship :

$$\ln I_0 / I = -c b \quad = A = O.D$$



I = Incident Light**I : Transmitted Light****Absorbing
Medium**

Figure no. (1) shows the intensity of absorption according Beer - Lambert law

METHOD

1- Several concentrations were taken (0.25 , 0.5 , 0.75 , 1 , 1.25 gm/ 100 ml) from Albumin solution and exposed each concentration to Helium – Neon laser irradiation , then the absorption of each concentration was counted before and after exposure to irradiation by using (Spectrophotometer PD-303)

2- The lower concentrations were taken (0.25, 0.5 , 0.75 gm/ 100ml) only from Albumin solution and exposed to Helium – Neon laser irradiation for (60 min. , 30 min) for each concentration then the angular frequency was counted for each period of time .

$$f = \frac{1}{\text{time}} - 1$$

Sec

RESULTS: -

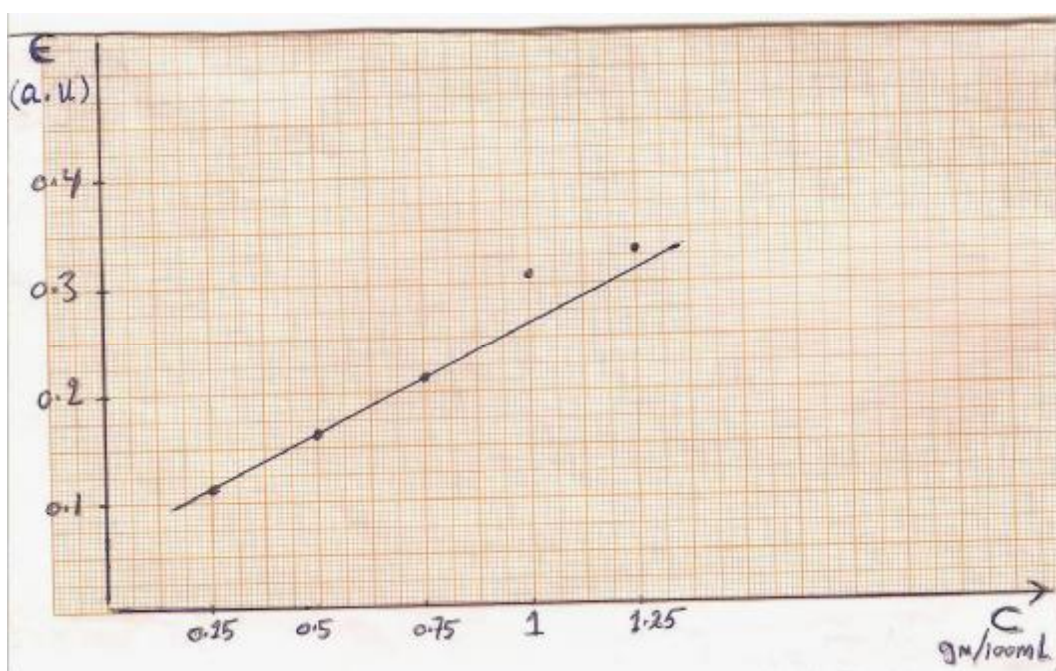
Table (1) , explains Albumin Absorption coefficient values fore a different concentration.

Wave Length (max)	Concentration Gm/ 100 mL	Absor.Coeff.Berfore irradiation a.u	Absor.Coeff. After Irradiation a.u
632.8 nm	0.25	0.148	0.123
	0.5	0.191	0.160
	0.75	0.272	0.222
	1	0.325	0.310
	1.25	0.340	0.317

Table (2) , explains Albumin Absorption coefficient values for low concentration with existence of variation of angular frequency.

Concentration gm/100 mL	Angular freq. $f = \frac{1}{t}$ (sec)	Absor.coeff. After (30)min a.u	Absor.freq. $F = \frac{1}{T}$ (sec)	Absor. Coeff. After (60)min a.u
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	Time = 30 min		Time=60 min	
0.25	5.5×10^{-4}	0.238	2.7×10^{-4}	0.249
0.5	5.5×10^{-4}	0.345	2.7×10^{-4}	0.355
0.75	5.5×10^{-4}	0.495	2.7×10^{-4}	0.505



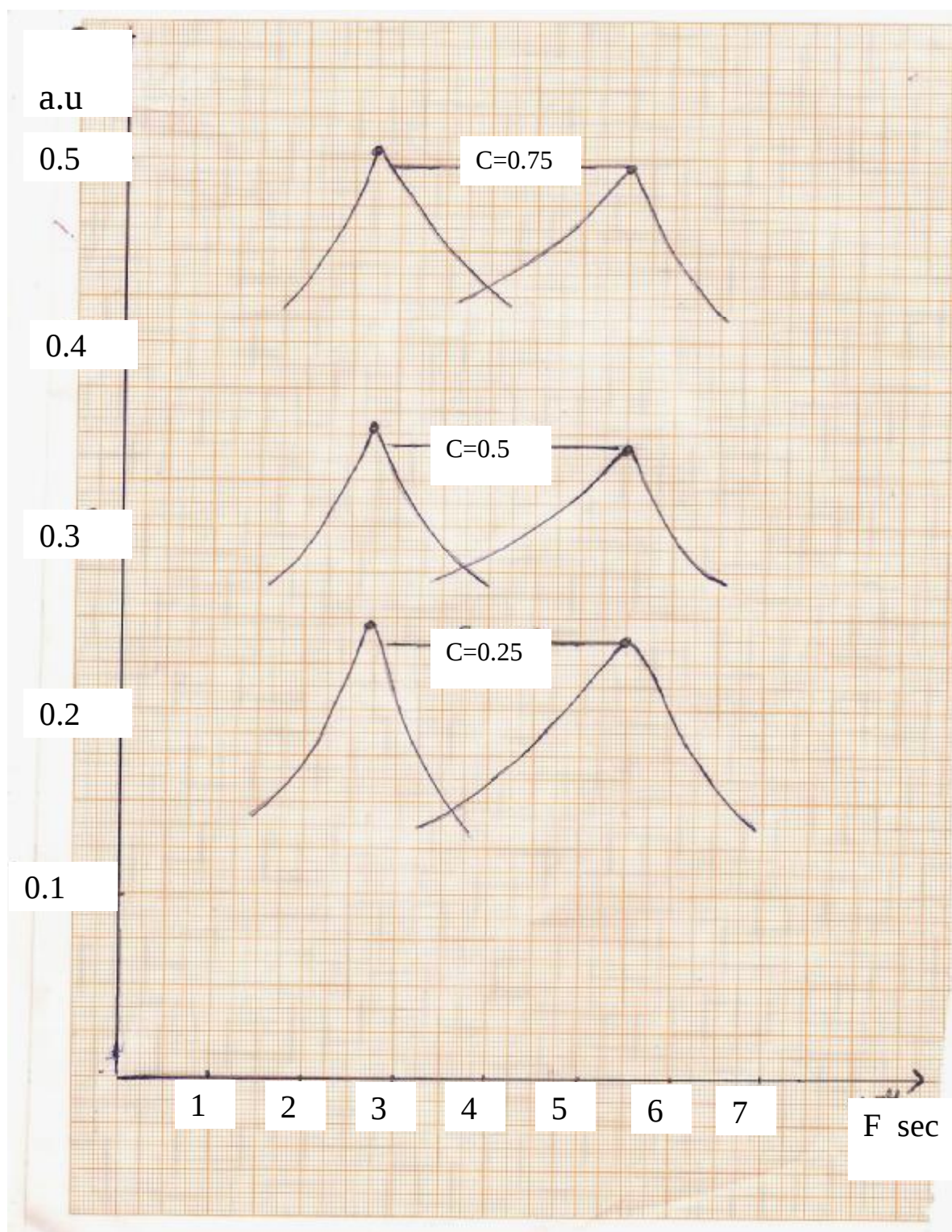


Figure no.(2) shows laser pulse for lower concentration.

Discussion :

Figure (1) includes (A) and (B)) shows the relation between absorption coefficient and the extents of Albumin solution concentrations (0.25 , 0.5 , 0.75 , 1 , 1.25 gm/100 ml) whereas many absorbed systems in light solutions follow Beer law [6] , its text is that the line relation between absorption and concentration in the same size of solution and its inclination equals as shown in the following relation :-

$$A = \quad . \quad b. \quad c$$

When concentration drawing in return to absorption is not linear , then the behaviour is called inclination of Beer Law and the reason of inclinations relates to mechanical or chemical factors and it might be positive when the inclination is to the upper or might be negative when the inclination is towards down. Figure no.(1) : B shows the drift in linear after concentration (0.75) and it is obvious from the drawing that the relation between absorption and concentration is linear in lower concentrations.[7]

While figure (2) shows the laser pulse for Albumin solution for lower concentrations (0.25, 0.5 , 0.75 , gm / 100 ml) , it is obvious that the top of absorption increases with the increase of concentration of Albumin solution , the increasing of concentration leads to increasing the number of effected minutes in absorption.[8]

Conclusions : -

- 1- The value of absorption increases with the increasing the concentration of Albumin solution with existing a drift on line . [9]
- 2- It is shown that the best extent from lower concentration , Beer Law will be applied on it . [10]

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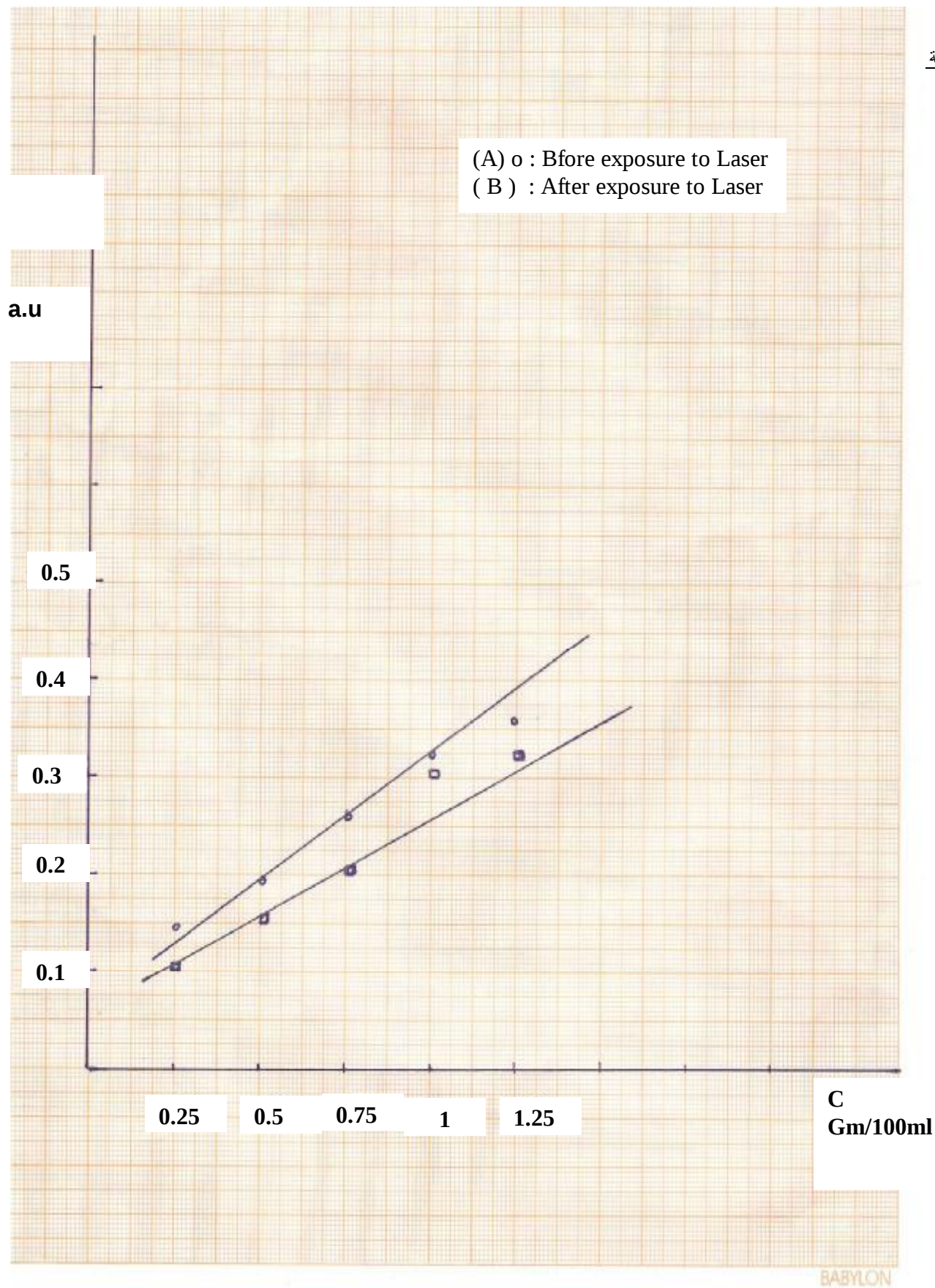


Figure (1) shows the line relation between absorption coefficient and concentration (A)before & (B) after exposure to laser.