

DEDICATION

To my Mother

To my Father

And

To her...

For waiting for
me

Sulima
n

Acknowledgment

Thankfulness and prays to Allah "subhanaho wa ta'ala", prays and peace on the prophet Mohammed and his followers.

With my deepest respect and absolute gratefulness, I would like to thank my reverend supervisor Professor Dr. Nafi Abdul Latif, for his elegant superiority guidance, superb encouragement, and advantageous criticism which contributed to this study.

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Suliman

Abstract

In this work thin films were produced from (Chloroform and Rhodamine 6G) deposited on glass substrate that has a thickness (1mm) and refractive index (1.3) in a vacuum chamber firstly; without heating (at room temperature) and secondly; with heating (at different temperatures). These films can be used as optical components (filters, reflectors, attenuators, mirrors ... etc). The optical properties for each thin film were determined.

The thickness of the thin film was measured by interference phenomena during the deposition process for He-Ne laser with a power (1 mW).

Incident and transmitted intensity was measured for the prepared films at different laser wavelengths extended from mid visible (532nm) to near infrared region (1064nm). These intensities were used to calculate the transmission percentage and the reflectance as a function of wavelengths. Also the refractive index and the absorption coefficient for

each sample were deduced. All these measured and calculated values obtained at vertical incidence of laser on the thin film.

The results that were obtained from prepared films without heating gave a good indicator to use these materials as filters at some wavelengths, but the films tend to be inhomogeneous and this gave a variation in the results if the measurement were done at different points of the layer of the film.

At different temperatures the prepared films tended to be homogenous and the layer of each film gave a good indicator to use these materials as mirrors or optical filters at some wavelengths.

Also the results showed that, the optical properties of thin films are not dependent on the thickness, but mainly on the temperature of the substrate.

المستخلص

تم في هذا العمل إنتاج أغشية رقيقة من مادتي (الكلورفورم - والرودامين 6G) عند ترسيبها على سطح زجاجي ذو معامل إنكسار (1.3) وسمك (1 ملم) داخل حجرة مفرغة من الهواء وذلك في حالتين ، أولاً : بدون تسخين (عند درجة حرارة الغرفة) ، وثانياً: بعد تسخين السطح الزجاجي إلي درجات حرارة مختلفة وذلك لغرض دراسة الخصائص البصرية لهذه المواد وتقييم إمكانية استخدامها كمكونات بصرية (عواكس، مرشحات، موهنات، ... الخ).

تم قياس سمك الغشاء المنتج أثناء عملية الترسيب (عملية الترسيب للسوائل) بواسطة ظاهرة التداخل لشعاع ليزر الهليوم نيون بقدره (1 ملي واط) ، ثم أجريت عدة قياسات على هذه الأفلام كقياس الشدة الساقطة والنافذة لليزر ذات أطوال موجية إمتدت من منتصف الطيف المرئي (532 نانومتر) إلي المنطقة تحت الحمراء القريبة (1064 نانومتر) ، حيث تمت الإستفادة من هذه القياسات لحساب النفاذية كنسبة مئوية والانعكاسية كدالة للأطوال الموجية.

تم التوصل إلي الخصائص البصرية للأغشية مثل معامل الإمتصاص ومعامل الانكسار لكل غشاء وذلك من القياسات أعلاه ، ورسمت علاقات بيانية لكل هذه القياسات كدوال في الأطوال الموجية. كل القياسات

والحسابات أعلاه تمت لحالة السقوط العمودي لأشعة الليزر علي سطح الغشاء.

النتائج المتحصلة للأغشية الرقيقة التي تم ترسيبها بدون تسخين (عند درجة حرارة الغرفة) لكلتا المادتين أعطت مؤشراً لإمكانية إستخدام هذه المواد كمرشحات بصرية عند بعض الأطوال الموجية ، كما وجد كذلك أن هذه الأفلام تميل الى عدم التجانس (في الطبقة المترسبة) مما يعطي إختلافاً في القياسات إذا تمت في مناطق مختلفة على سطح الغشاء. أما في حالة التسخين إلي درجات الحرارة المختلفة فإن هذه المواد أعطت نتائج جيدة الى الحد الذي يُمكن من إستخدامها كمرايا أو مرشحات بصرية عند بعض الأطوال الموجية ، كما وجد أيضاً أن الإختلاف في درجات الحرارة يؤثر على الخصائص البصرية للأغشية.

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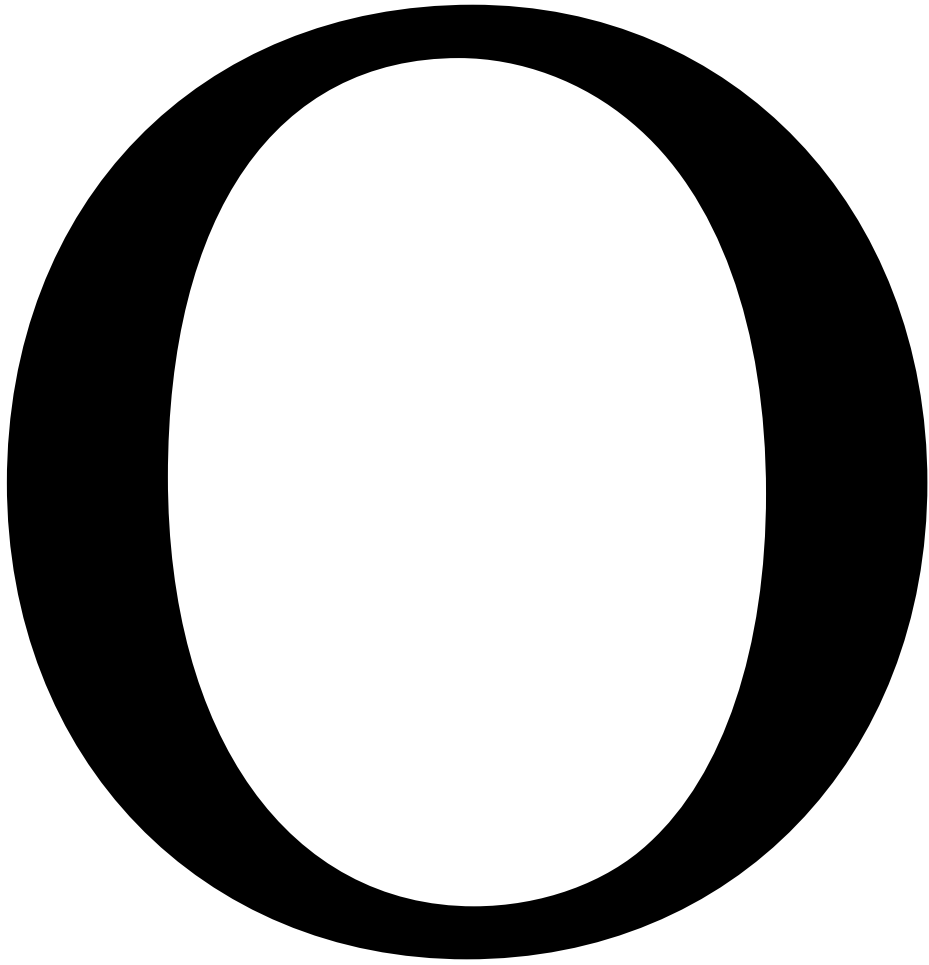
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II

(هو الله الذي لا إله إلا هو عالم الغيب
والشهادة هو الرحمن الرحيم) (22 هو
الله الذي لا إله إلا هو الملك القدوس
السلام المؤمن المهيمن العزيز الجبار
المتكبر سبحان الله عما يشركون(23) 2
هو الله الخالق الباري المصور له
الأسماء الحسني يسبح له مافي
السموات والأرض وهو العزيز الحكيم 2
4)

و

الآيات (24-22) سورة الحشر