

و قال تعالى:

بسم الله الرحمن الرحيم

{قُلْ هَلْ يَسْتَوِي الَّذِينَ يَعْلَمُونَ وَالَّذِينَ لَا يَعْلَمُونَ
إِنَّمَا يَتَذَكَّرُ أُولُو الْأَلْبَابِ}

صدق الله العظيم

سورة الزمر - الآية [9]

DEDICATION

For my parents

For my son

For my sisters

For my brothers

For my lovely friends

For whom which I need

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Abstract

In this work, the optical properties of pure polyvinyl alcohol (PVA) and PVA doped with silver nitrate with different mass ratios were studied using different types of monochromatic light sources in wavelength range (360-920) nm. All samples were prepared as disks by pressing the powder using compressor, the fabricated disks with different thicknesses (3.13, 4.61, 6.24, 7.73, 9.10, 10.97) mm for pure PVA, and a disk with a thickness (9.10mm) was chosen and prepared with different ratios of silver nitrate (10,20,30,40,50) % for doped PVA.

The incident light intensities were measured in the absence of samples, which regarded as the reference (I_0), then the transmission intensities (I_T) for each sample were measured by placing the monochromatic light source, the detector, and the sample on the same line. The reflected intensities (I_R) also were measured by placing the monochromatic light source and the detector at angle of 45° with the samples. The absorption coefficient for all sample were calculated using Beer-Lambert law. In addition, the refractive index also was calculated for each sample.

The optical properties (absorption coefficient, transmission percentage, and refractive index) of fabricated disks with different thicknesses and different concentration of silver nitrate of pure and doped PVA were plotted as a function of wavelength.

The obtained results showed the possibility of using pure PVA and doped PVA as an optical filter in certain wavelengths or as reflector for other wavelengths, and there is a change in the optical properties due to doping of PVA by silver nitrate.

المستخلص

في هذا البحث، تم دراسة الخصائص البصرية لبوليمر (PVA) النقي و كذلك PVA المشوب بنترات الفضة بنسب مختلفة وذلك باستخدام أنواع مختلفة من المصادر الضوئية يتراوح طولها الموجي من 360 إلى 920 نانومتر. تم تحضير العينات من PVA على شكل اقراص مضغوطة ذات سمك مختلف (3.13، 4.21، 6.42، 7.73، 10.97، 9.10) ملي متر، و تم إختيار قرص بسمك 9.10 ملي متر وتم تشويبه بنسب مختلفة من نترات الفضة (10,20,30,40,50)% .

تم قياس النفاذية لكل العينات بوضع مصدر الضوء والعينات والكاشف الضوئي على إستقامة واحدة بحيث تصل الأشعة من المصدر إلى العينات ومنها إلى الكاشف مباشرة ، قيست شدة المصادر الضوئية قبل وضع العينات (I_0) . ثم بعد ذلك وضعت العينات بين المصدر والكاشف وقيست شدة الأشعة النافذة (I_T). وأيضا قيست شدة الأشعة المنعكسة (I_R) وذلك عن طريق وضع الكاشف والمصدر الضوئي بزاوية 45^0 بالنسبة للعينات . ثم تم حساب معامل الأمتصاص لكل عينة باستخدام قانون بير لامبرت، وأيضا تم حساب معامل الإنكسار لكل العينات النقية والمشوبة.

رسمت العلاقات بين الخصائص البصرية (معامل الامتصاص ، النفاذية كنسبة مئوية ، معامل الانكسار) مع الأطوال الموجية لكل العينات النقية والمشوبة.

أظهرت النتائج التي تم الحصول عليها إمكانية استخدام البوليمر النقي والمشوب كمرشح بصري في أطوال موجية معينة أو عاكس لأطوال موجية أخرى، ونجد ان هناك تغير في الخصائص البصرية بعد التشويب بواسطة نترات الفضة.

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