Electrical properties for pure PVA and doped with Cobalt Chloride panel

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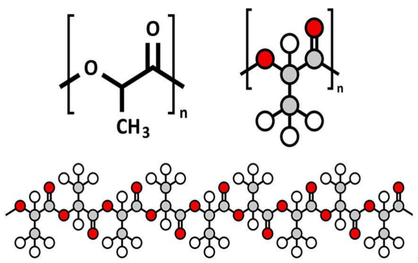
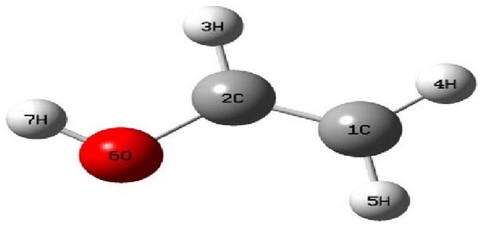
Introduction

A polymer is a substance composed of molecule characterized by the multiple repetition of one or more species of atoms or groups of atoms(constitutional repeating units) linked to each other. The natural polymers are generally condensation polymers made by addition of monomer such that shown in figure (1) units one at a time to the ends of growing polymer chains. Polymerization of all chains stops at identical molecular weights.



Polyvinyl Alcohol

Polyvinyl alcohol (PVA) is a linear synthetic polymer produced via partial or full hydrolysis of polyvinyl acetate to remove the acetate groups



Methodology

Preparation of polymeric samples

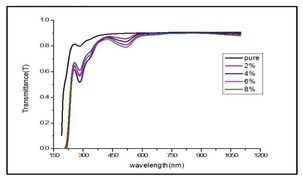
Divided into two parts first one is preparation of liquid sample that shown in figure (1),

and second one is preparation of thin film sample, Cobalt acetate was added to polyvinyl alcohol, as samples were prepared in the form of films consisting of a mixture of polymer and cobalt acetate impurity by dissolving PVA in hot water at (70 ℃) by (10 %) weight, then adding cobalt acetate in different proportions (0.2g,0.4g,0.6g,0.8g) and using the magnetic mixer and take a data for liquid sample and after twenty four hour we get a homogeneous solution and then pour the mixture into the glass molds to get a thick film ($5 \pm 25\ \mu m$).

using the film sample in solar panel like shown in figure (2) .

Result

Figure (1) relation between wavelength and Absorbance of thin film sample with different impurity. **Figure(2)** Permeable membranes (PVA) doped with (COCl) with different doping ratios.



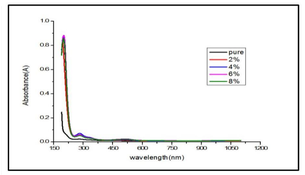
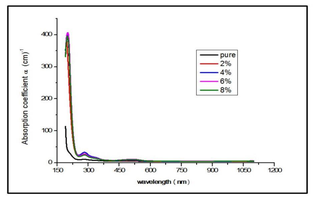


Figure (3) Shows the absorption coefficient of membranes (PVA) Dopedwith (COCl) with different doping ratios. **Figure (4)** Shows the energy gap values of pure (PVA) membranes .



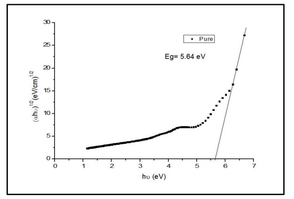
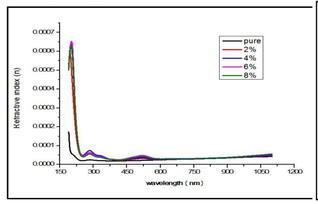


Figure (5) Shows the refractive indexof the membranes (PVA) Dopedwith (COCl) with different doping ratios. **Figure (6)** Shows damping coefficient of the pure membranes (PVA) And doped with (COCl) with different doping ratios.



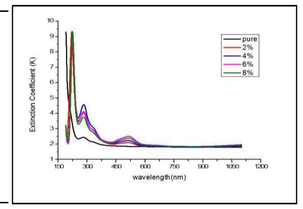
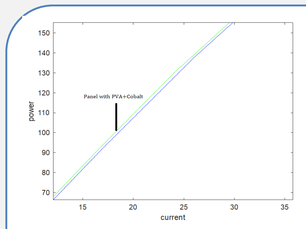
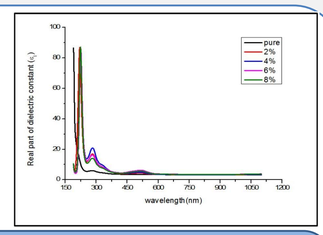


Figure (7) Shows real dielectric constant to f membranes (PVA) Doped with (COCl) with different doping ratios, **Figure (8)** relation between power and current .





Conclusion

Preparation of films from the compound (PVA-CoCl) successfully by casting method. The insulating material represented by the polymer (PVA) was successfully converted into a semiconductor material after adding a (CoCl) salt to it. All the optical properties represented by (transmittance, attenuation coefficient, dielectric constant in its real and imaginary parts) have been affected by the doping process towards better properties than this compound can be used in many physical applications..

References

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