

## Elaboration of Polymethylene Blue on Conducting Glassy Substrate and Study of Its Optical, Electrical and Photoelectrochemical Characterization

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**Abstract :** The poly methylene bleu (PMB) has been successfully electro deposited on fluorine doped tin oxide (FTO) conducting glass as substrate. Its optical, electrical and photoelectrochemical characterizations have been carried out in order to show the performances of such polymer. The deposited film shows a good electric conductivity which is well confirmed by the low gap value determined optically by UV-vis spectroscopy. Like all polymers the PMB presents an absorption difference in the visible range function of the polarization potential, it is expressed by the strong conjugation at oxidized state but is weakened with leucoform formation at reduced state. The electrochemical analysis of the films permit to show the cyclic voltamperogram with the anodic oxidation and cathodic reduction states of the polymer and to locate the corresponding energy levels HOMO and LUMO of this later. The electrochemical impedance spectroscopy permit to see the conductive character of such film and to calculate important parameters as  $R_{tc}$  and CPE. The study of the photoelectro activity of our polymer shows that under exposure to intermittent light source this later exhibit important photocurrents which enables it to be used in photo organic cells.

**Keywords :** polymethylene blue, electropolymerization, homo-lumo, photocurrents

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