

**PREPARATION AND STUDY OF ELECTRICAL
PROPERTIES OF SOME PHTHALOCYANINE COMPOUNDS**

Master degree of science in chemistry

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Summary

The discovery of organic semiconductors in the fifties of the twentieth century was an important step towards a new types of semiconductors their properties can be controlled by controlling the chemical and crystalline structure such as phthalocynines and other conductivity polymers.

In this study many polymeric phthalocynine compounds with different central metal atoms with their copolymers and mixtures. Phthalocyaninato aluminium fluoride (AlPcF_n), phthalocyninato iron fluoride (FePcF_n), phthalocyninato gallium fluoride, their copolymer ($\text{M}_1\text{PcF}-\text{M}_2\text{PcF}$) and their mixture of 1:1 molar ratio were prepared.

The prepared compounds are characterized by elemental analysis, infrared and Uv-visible spectroscopy.

The infrared spectra of the prepared compounds are characterized by the appearance of a broad bands in the range $(400-600) \text{ Cm}^{-1}$ which attributed to the stretching vibration of the (M-F) bond. These bands refer to the bridging structure of these polymers.

The Uv-visible spectra are characterized by the appearance of two absorption bands. The first at the range $(600-700) \text{ nm}$ which is called Q-band and the second band which is called B or soret-band. These bands are attribute to $\pi \rightarrow \pi^*$ transition which belong to the hetro-aromatic system of the phthalocynine molecule.

The thermal stability of the prepared compound is defined by means of thermogravimetric analysis and they are found to be having a high thermal stability indicating the polymer nature of these compounds.

The dc conductivity of these compounds is studied as compacted discs in the range of $(273-403) \text{ k}$. Moreover, the effect of doping of the copolymers containing transition or non- transition metal atom such as (Al, Fe, Ga, Cr), with iodine is studied too. In this work we found that the copolymer containing (Al-Fe) metals give high conductivity in relative to its components and to other copolymers.

Doping the copolymers with iodine has no influence upon the conductivity except the copolymer containing (Ga-Cr) as central metal atoms.