

**Metal Containing Liquid Crystal polymers
(MLCPs)**

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**Thesis Submitted in Partial Fulfillment of the Requirement for
the Master of Science in Applied Chemistry**

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Dedication

Dedication to my beloved Sudan , bless his civilization , the success of the December revolution glorious , mercy and the hood of the martyrs.

Dedication to my mother, who was supporting me all of the time

Dedicate to everyone who helped me and stood beside me ,in the circumstances of the country.

The ideal supervisor Dr. Nazar Mohammed Gabra for his guidance , supervision and fruitful idea throughout this study.

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Lastly Great and special thanks to Abdoalsamad Ahmed for his effective and permanent help I wish him great success in reconciling life and work.

Declaration

I hereby declare that this thesis is based on my own original work except for quotations and citation, which have been duly acknowledged. I also declare that it has not been previously or concurrently submitted for any other degree at Red Sea University or any other institutions.

Entssar Mohammed Nassim

Date: / /2020

APPROVAL

This is to certify that an Examination Committee has met on 25th October 2020 to conduct the final examination of Entssar Mohammed Nassim on her Master of Science thesis entitled ‘‘Metal Containing Liquid Crystal Polymers’’ in accordance with the regulations approved by the Red Sea University senate. The Committee recommends that the candidate be awarded the relevant degree . The Examination Committee members were :

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Abstract

Abstract of thesis present to the Senate of Red Sea University In partial fulfillment of requirement for the degree of Master of Science in applied chemistry.

Metal Containing Liquid Crystal Polymers(MLCPs)

Entssar Mohammed Nassim

October 2019

Main Supervisor : Dr .Nazar Mohammed Gabra , PH.D.

Faculty of Post Graduate Studies

The chelating resin(3Dliquid crystal polymer) was synthesized by poly condensation reaction of 4-hydroxy Benzaldehyde, formaldehyde and biuret under alkaline condition . The prepared Resin was characterized by IR spectroscopy and UV spectroscopy . The resin sample was carried isothermally at 120^o C . The analytical evaluation of the prepared resin toward the studied ions (Cr III) using the batch method , and studied a different pH and different treatment time . The coordination polymers of (CrIII) were characterized by magnetic and conductivity measurements , ultraviolet-visible and IR spectroscopy , the stress- strain experiment of 4HBFB –metal coordination polymer obtained rubber – like structure were carried out and the value of braking – strain . The conductivity were found in the (.5 Sm-1/1gm) . Thus , it was suggest that they can be used as amembrabe adhersive and a good conductive conductor .

Key word:

Polymers , liquid crystal polymers , metal containing liquid crystal polymers .

مستخلص الرسالة لمجلس اساتذة جامعة البحر الأحمر
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كلية الدراسات العليا

اشتمل البحث علي تخليق بوليمر ثلاثي الأبعاد من 4-هيدروكسي بنزالدهيد فورمالدهيد بيوريت
تحت ظروف قاعدية ، تم وصفه بواسطة الأشعة تحت الحمراء والأشعة فوق البنفسجية . تم
توليف البوليمر الناتج مع معدن الكروم الثلاثي . تم التعرف علي المعقد المتناسق مع الكروم
الناتج بواسطة الأشعة تحت الحمراء والأشعة فوق البنفسجية ، وقياس الموصلية وإجهاد القص
له. المعقد الناتج يحمل صفات المطاط وموصلية قدرها 0.5 لكل واحد جرام، تلك الصفات تمنحه
الإستخدام كغطاء لاصق وموصل جيد.

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List of Abbreviations

Abbreviation	Definition
4-HBFB	4-hydroxybenzaldehyde formaldehyde-biuret.
LCPs	Liquid crystal of polymers.
MOF	Metal – organic frameworks.
IR	Infrared.
UV	ultraviolet – visible.
PAA	polyacrylamide.
PVA	poly (vinyl alcohol).

