

Contents

	Page
CHAPTER I	
Introduction	
<i>I-A- General Introduction</i>	1
I-A-1-Methods of preparation of polyesters	2
I-A-2-Methods of synthesis of polymer complexes.....	5
I-A-3- Characterization of polymer-metal complexes ,.....	15
I-A-4- Electrical properties of polymer-metal complexes.....	16
<i>I-B- Literature Survey</i>	19
<i>I-C- Aim of work</i>	27
<i>I-D- Theoretical Review and Methods of Calculations.....</i>	28
I-D-1- Electrical Conduction in Solids:	
I-D-1-a- DC-Conductivity.....	29
I-D-1-b- AC- Conductivity.....	30
I-D-1-c- Dielectric properties of solids.....	31
CHAPTER II:	
Experimental	
II-1-Materials and preparation	35
II-2-a- Synthesis of polyesters.....	36
II-2-b- Synthesis of polyester metal complexes	38
II-2-c- Synthesis of polyester-Double Metal complexes.....	39
<i>II- 3- Measurement and Instrumentation:</i>	
II-3-a- Elemental analysis.....	40
II-3-b- Infra-red spectroscopy (IR).....	40

II-3-c- ^1H -NMR spectroscopy.....	40
II-3-d- Thermal analysis (DTA-TG) measurements.....	40
II-3-e- Thermal mechanical analysis (TMA).....	41
II-3-f- Electrical conductivity measurements.....	41

CHAPTER III

Results and Discussion

<i>III-A- Chemoselective polycondensation.....</i>	42
<i>III-B-Composition of prepared compounds</i>	
III-B-1- Elemental analysis studies.....	43
III-B-2- IR spectral studies	43
III-B-3- ^1H NMR Spectral studies.....	47
<i>III-C-Thermal Analysis of Investigated polyesters and its Metal Complexes:</i>	
III-C-1- Thermal gravimetry TG and Differential Thermal Analysis (DTA).....	72
III-C-1-a- Thermal Analysis of PHMA and Its Metal Complexes.....	72
III-C-1-b- Thermal Analysis of PDEA and Its Metal Complexes.....	74
III-C-1-c- Thermal Analysis of PPA and Its Metal Complexes.....	76
III-C-1-d- Thermal Analysis of PDPA and Its Metal Complexes and Double-Metals complexes.....	78
III-C-2- Thermal Mechanical Analysis (TMA).....	81
<i>III-D- Electrical properties of Polymer sample:</i>	
III-D-1- Electrical Conductivity.....	97
III-D-2- Relative permittivity and Dielectric loss.....	110
Summary.....	i
References.....	121
Summary in Arabic.	