

Dedication

To the soul of my mother, may Allah have mercy on her!!

To the one whom I owe my success to, for all the best things that he has done for me and taking good care of me...

My fosterbrother (Dear Uncle).

Acknowledgement

Thanks and gratefulness to Allah the almighty for the grace of enlightenment.

Thanks to prophet Mohammed (PBUH), may Allah grant him the highest place in paradise!

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A b s t r a c t

Room temperature superconductors have been a dream for decades. Most researches in this area focused on cuprate superconductors. In this research, a prepared sample of YBCO (Y123) superconductor was studied to investigate its electrical properties at and above room temperature. Electrical measurements were carried out by a digital voltmeter and a multi-meter. An origin 9 program was used to analyze the results. The multi-meter showed presence of conductivity during the heating. The voltmeter showed proportionality of voltage with temperature. Room temperature measurements showed an existence of resistivity. Results analysis revealed exponential decay in conductivity of the sample with heating. Y123 sample exhibited semiconductor electrical characteristics.

المستخلص

الحصول على موصلات فائقة عند درجة حرارة الغرفة ظل حلمًا لعقود. معظم الأبحاث في هذا المجال قد ارتكزت على المركبات التي تحتوي اوكسيد النحاس كأساس في صيغتها البنائية. في هذا البحث تم دراسة عينة من YBCO (Y123) محضرة مسبقا وذات توصيل فائق للتحقق من خصائصها الكهربائية عند وفوق درجة حرارة الغرفة (25 درجة مئوية). تم إجراء القياسات الكهربائية باستخدام مقياس جهد رقمي ومقياس تيار (ملتيميتر)؛ استخدم برنامج حاسوبي (Origin 9) لتحليل النتائج. أظهر مقياس التيار وجود توصيل كهربائي أثناء التسخين. قياسات الجهد أشارت إلى وجود علاقة طردية للجهد مع درجة الحرارة. قراءات الجهد والتيار عند درجة حرارة الغرفة كشفت عن وجود مقاومة كهربائية للعينة. تحليل النتائج أوضحت علاقة الإضمحلال الأسية للموصلية الكهربائية للعينة مع إرتفاع درجة الحرارة. وعلى حسب النتائج المتحصلة نجد أن المركب قد أبدى سلوكا كهربيا كالسلوك الكهربائي لشبه الموصل.

Table of Contents

No.	Contents	Page No.
1	Verse	I
2	Dedication	II
3	Acknowledgement	III
4	Abstract in English	IV
5	Abstract in Arabic	V
6	Table of Contents	VI
7	List of Figures	VIII
8	List of Table	IX
9	CHAPTER ONE INTRODUCTION	1
1.1	Preface	1
1.2	Research Problem	2
1.3	Research Importance	2
1.4	Aim of the Research	2
1.5	Thesis Layout	3
	CHAPTER TOW LITERATURE REVIEW	4
2.1	Introduction	4
2.2	Resent Works	5
	CHAPTER THREE METHODOLOGY	9
3.1	Introduction	9
3.2	Setup	9
3.3	Method	9

3.4	The Results	11
	CHAPTERFOUR DISCUSSION AND CONCLUSION	20
4.1	Discussion	20
4.2	Conclusion	21
4.3	Recommendation	22
	References	23

List of Figures

No.	Subject	Page No.
1	Figure (3.1): Experiment arrangements. 1, 2, 3, 4 and 5 stand for Y123 superconductor, multi-meter, digital voltmeter, power source and rheostat, respectively	10
2	Figure (3.2): V-I characterization for fixed value of the parameter T (=297K) obtained from the results on Table (3.1). Linear fitting was done for slope calculation	14
3	Figure (3.3): V-I characterization for fixed value of the parameter T (=318K) obtained from the results on Table (3.2). Linear fitting was done for slope calculation	15
4	Figure (3.4): V-I characterization for fixed value of the parameter T (=333K) obtained from the results on Table (3.3). Linear fitting was done for slope calculation	16
5	Figure (3.5): V-I characterization for fixed value of the parameter T (=348K) obtained from the results on Table (3.4). Linear fitting was done for slope calculation	17
6	Figure (3.6): V-I characterization for fixed value of the parameter T (=363K) obtained from the results on Table (3.5). Linear fitting was done for slope calculation	18
7	Figure (3.7): The exponential decay of Y123 conductivity above room temperature	19

List of Table

No.	Subject	Page No.
1	(3.1): calculated voltage (V) and current (I) at T= 297K	11
2	(3.2): calculated voltage (V) and current (I) at T= 318K	12
3	(3.3): calculated voltage (V) and current (I) at T= 333K	12
4	(3.4): calculated voltage (V) and current (I) at T= 348K	13
5	(3.5): calculated voltage (V) and current (I) at T= 363K	13
6	(3.6): obtained conductivity relative to applied temperature	14