

Dedication

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To my father's soul

To my mother

To my brothers& sisters

||

To my colleagues

To you

III

v

Acknowledgement

After thanking Allah for inspiring me to accomplish this work, I would like to express my faithful indebtedness to Prof. Dr. Nafie A.

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ABSTRACT

The objective of this research was the utilization of laser induced breakdown spectroscopy (LIBS) technique in investigation of elements in three different

kinds of gasoline. Q-switched-Nd: YAG Laser with 10 (ns) pulse duration, 23.4 (mJ) energy per pulse, 0.5 Hz repetition rate was used and focused on the sample to achieve high power density leads to very high temperature in the focal volume and then undergo a number of reactions resulting in formation of a plasma for the sample with discrete emission lines which represent fingerprints of the atoms and ions constitute the sample. A spectrometer connected to PC was used to

collect and record the emission spectra of the samples plasma. The recorded spectra were processed by subtracting the dark current, pumping flashlamp spectra and background radiation. The elements were identified from the emitted lines after referring to the atomic spectra database. A comparison was done between the sample contents. The results showed that there are elements found

in all the three samples with different amounts while there are some elements that not found in all the three kinds of gasoline.

المستخلص

الهدف من هذا البحث هو استخدام تقنية مطيافية الانهيار الكهربائي المستحث بالليزر لإستكشاف العناصر الموجودة فى ثلاث عينات مختلفة من الجازولين.

استخدم ليزر النيوديميوم- ياق ذي التشغيل المفتاحي النبضي بزمن نبضة مقدارها 10 نانو ثانية وبطاقة نبضة مقدارها 23.4 (ملي جول) وبتكرارية مقدارها 0.5 هيرتز. جمعت حزمة الليزر على العينة للحصول على كثافة قدرة عالية تؤدي الى ارتفاع فى درجات حرارة الجزيئات عند بؤرة الحزمة عندها تحصل عدة تفاعلات تؤدي الى تكون البلازما من العينة لها خطوط انبعاث طيفية مميزة تمثل بصمة تعرف بها الذرات والايونات المكونة للعينة. استخدم جهاز مطياف مربوط بجهاز

الحاسب لتسجيل الإنبعثات ومعالجتها عبر برنامج اسبيكترواسويت للتخلص من طيف المصباح المستخدم فى ضخ الليزر وتيار الظلام و الإشعاع من الوسط المحيط. تم تحديد العناصر الموجودة فى كل عينة بواسطة الخطوط الطيفية المنبعثة وذلك بعد الرجوع الى قاعدة بيانات الاطياف الذرية للذرات و الايونات. تمت المقارنة بين محتويات كل عينة. اوضحت النتائج ان هنالك بعض المكونات

موجودة فى كل العينات الثلاث بكميات متفاوتة فى حين ان بعض المكونات لا
توجد فى كل العينات.

CONTENTS

XX

Article	Page No.
الأية	
Dedication	I
Acknowledgement	II
Abstract	III
المستخلص	IV

Contents	V
List of figures	VII
List of tables	IX
CHAPTER ONE	
INTRODUCTION AND BASIC CONCEPTS	
1.1 INTRODUCTION	1
1.2. ABSORPTION AND EMISSION OF RADIATION	2

1.2.1. Absorption	2
1.2.2. Spontaneous emission	3
1.2.3. Stimulated emission	4
1.3. PRINCIPLES OF SPECTROSCOPY	4
1.4. LASER SPECTROSCOPY	6
1.4.1. Absorption spectroscopy	7
1.4.2. Laser-induced molecular dissociation	8
1.4.3. Laser-Raman spectroscopy	9

1.4.4. Hyper Raman spectroscopy	10
1.4.5. Coherent anti-Stokes Raman scattering spectroscopy	11
1.4.6. Laser Stark (or laser electronic resonance) spectroscopy	12
1.4.7. Laser induced fluorescence (LIF)	13
1.4.8. Cavity ring-down spectroscopy(CRDS)	14
1.4.9. Light detection and ranging (LIDAR)	15
1.5. LASER INDUCED BREAKDOWN SPECTROSCOPY (LIBS)	16
1.6. BASIC COMPONENTS OF LIBS AND THE PHYSICAL	19

PROCESSES	
1.6.1. Lasers for LIBS	19
1.6.2. Basic Physical Principles	21
1.6.3. Characteristics of LIBS	23
1.6.3.1. The LIBS method	23
1.6.3.2. The physics and chemistry of the laser plasma	25
1.6.3.3. Forming the LIBS plasma in a liquid	29
1.7. LIBS AS AN ANALYTICAL TECHNIQUE	30

1.8. THE AIM OF THE WORK	30
1.9. LITERATURE REVIEW	31
CHAPTER TWO THE EXPERIMENTAL PART	
2.1. INTRODUCTION	34
2.2. EXPERIMENTAL SETUP	34
2.2.1. The laser	35

2.2.2. The spectrometer	37
2.2.3. Optical fiber	40
2.2.4. The software	41
2.3.MATERIALS	42
2.4. EXPERIMENTAL PROCEDURE	44
CHAPTER THREE	
RESULTS AND DISCUSSION	

3.1. INTRODUCTION	46
3.2. LIBS RESULTS	46
3.3. CONCLUSIONS	57
3.4. FUTURE WORK	58
REFERENCES	59

LIST OF FIGURES

Figure	Page No
Figure (1-1): Schematic illustration of the three processes: (a) spontaneous	3

XXX

emission, (b) stimulated emission, (c) absorption.	
Figure (1-2): Linear laser-absorption spectroscopy using tunable laser (a) Direct absorption. (b) opto-acoustic method using a microphone.	7
Figure (1-3): Schematic representation of laser photolysis by three methods.	8
Figure (1-4): Energy-level diagram for spontaneous Raman scattering.	9
Figure (1-5): The hyper Raman spectrum of ethane	10
Figure (1-6): Experimental arrangement for coherent anti-Stokes Raman	12

scattering	
Figure (1-7): Laser Stark spectroscopy with the sample inside the cavity. G, grating; S, Stark electrodes; W, window; M, mirror; D, detector	13
Figure (1-8): Schematic diagram showing how a cavity ring-down absorption spectrum is obtained	14
Figure (1-9): A LIDAR device using a Cassagrain telescope	15
Figure (1-10): A schematic of a simple apparatus for laser-induced	17

breakdown spectroscopy illustrating the principal components	
Figure (1-11): Photographs of a conventional electrode spark, an inductively coupled plasma, and a laser-induced spark. The size scales are different	18
Figure (1-12): Diagram of a typical laboratory LIBS apparatus	24
Figure (1-13): The important time periods after plasma formation during which emissions from different species predominate.	25

Figure (1-14): Life cycle diagram showing main events in the LIBS process.	26
Figure (1-15): Air plasma temperature as a function of time after plasma formation.	27
Figure (1-16): Electron density in the air plasma as a function of time after plasma formation.	28
Figure (2.1): The experimental setup	34

Figure (2.2): Schematic diagram of the setup	35
Figure (2.3): LRH786T Nd YAG laser resonator containing the rod and flash lamp	36
Figure (2.4): the focusing optics	37
Figure (2.5): the LRH786T Nd YAG laser power supply	37
Figure (2.6): the USB4000 Spectrometer	38
Figure (2.7): Components of the USB4000 Optical Bench	39
Figure (2.8): the Optical fiber used to collect spectrum	41

Figure (2.9): SpectraSuite software screen	42
Figure (3.1): LIBS emission spectrum of sample No 1	47
Figure (3.2): LIBS emission spectrum of sample No 2	49
Figure (3.3): LIBS emission spectrum of sample No 3	52

LIST OF TABLES

Contents	Page No.
-----------------	-----------------

XXXVIII

Table (2-1) the laser energy as a function of the applied voltage	35
Table (3-1) analysis of emission spectrum for sample No 1	47
Table (3-2) analysis of emission spectrum for sample No 2	50
Table (3-3) analysis of emission spectrum for sample No 3	52
Table (3-4) comparison between the atoms of the three	56

samples	
Table (3-5) comparison between ions of the three samples	56