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EXTRACTION AND IDENTIFICATION THE ASPIRIN FROM SOME PHARMACEUTICAL PRODUCTS BY USING I.R SPECTRA AND MELTING POINT METHODS

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Abstract:-

This study was carried on some pharmaceutical products containing aspirin. The samples were extracted then the infrared and melting point methods were used to identification the extracted by comparing with the standard aspirin sample. The results showed that the extracted samples gave the I.R spectra of the standard aspirin sample. Also the melting point values gave the same values of the standard value standard values of aspirin.

Keywords:-*I.R, identification, aspirin*

INTRODUCTION

Aspirin also known as acetylsalicylic acid (ASA), is a medication used to treat pain, fever, and inflammation. Specific inflammatory conditions in which it is used include Kawasaki disease, pericarditis, and rheumatic fever. Aspirin given shortly after a heart attack decreases the risk of death. Aspirin is also used long-term to help prevent heart attacks, strokes, and blood clots, in people at high risk [1].

Aspirin may also decrease the risk of certain types of cancer, particularly colorectal cancer. For pain or fever, effects typically begin within 30 minutes. Aspirin is a no steroidal anti-inflammatory drug (NSAID) and works similar to other NSAIDs but it is also an antiplatelet and suppresses the normal functioning of platelets [2]. Common side effects include an upset stomach. More significant side effects include stomach ulcers, stomach bleeding, and worsening asthma. Bleeding risk is greater among those who are older, drink alcohol, take other NSAIDs, or are on blood thinners. Aspirin is not recommended in the last part of pregnancy. It is not generally recommended in children with infections because of the risk of Reye's syndrome [3]. Aspirin, in the form of leaves from the willow tree, has been used for its health effects for at least 2,400 years [4]. By 1899, Bayer had named the drug Aspirin and was selling it around the world [5]. The word Aspirin was Bayer's brand name; however, their rights to the trademark were lost or sold in many countries. Aspirin's popularity grew over the first half of the twentieth century leading to competition between many brands and formulations. Aspirin is one of the most widely used medications globally with an estimated 40,000 tonnes (50 to 120 billion pills) being consumed each year [1, 6]. It is on the World Health Organization's List of Essential Medicines, the most effective and safe medicines needed in a health system [7]. Medicines made from willow and other salicylate-rich plants appear in clay tablets from ancient Sumer as well as the Ebers Papyrus from ancient Egypt. Hippocrates referred to their use of salicylic tea to reduce fevers around 400 BC, and were part of the pharmacopoeia of Western medicine in classical antiquity and the Middle Ages. Willow bark extract became recognized for its specific effects on fever, pain and inflammation in the mid-eighteenth century. By the nineteenth century pharmacists were experimenting with and prescribing a variety of chemicals related to salicylic acid, the active component of willow extract [8].

Chemical properties: Aspirin decomposes rapidly in solutions of ammonium acetate or the acetates, carbonates, citrates, or hydroxides of the alkali metals. It is stable in dry air, but gradually hydrolyses in contact with moisture to acetic and salicylic acids. In solution with alkalis, the hydrolysis proceeds rapidly and the clear solutions formed may consist entirely of acetate and salicylate [6]. The synthesis of aspirin is classified as an esterification reaction. Salicylic acid is treated with acetic anhydride, an acid derivative, causing a chemical reaction that turns salicylic acid's hydroxyl group into an ester group (R-OH → R-OCOCH$_3$) . This process yields aspirin and acetic acid, which is considered a by-product of this reaction. Small amounts of sulfuric acid (and occasionally phosphoric acid) are almost always used as a catalyst [3]. The following equation shows the preparation of aspirin:

Physical properties: Aspirin, an acetyl derivative of salicylic acid, is a white, crystalline, weakly acidic substance, with a melting point of 136 °C, and a boiling point of 140°C [7]. The study aims to extract the aspirin from some of pharmaceutical products which containing aspirin and identification of the extract by using simple methods including I.R analysis and melting point values.

MATERIALS AND METHODS

Sampling:

Nine different of commercial aspirin samples were collected from local markets at Al – Baida city during 2017, the samples were shown in Table (1)

Table (1): The studied aspirin samples:

No	The Sample Name	Company
1	Aspirin	Egypt
2	Jaspirin 80	U.A.E
3	Aspocide	Egypt
4	Rivo	Egypt
5	Aspirin 500	Tunis
6	Dispearible	India
7	Aspirin gastro	U.K
8	Jusprin 300	U.A.E
9	Aggrex	Egypt

The samples preparation:

Three tablets of each type of aspirin sample were grinded in mortar, the samples were derided in oven at 85 ^{0}C. The aspirin was separated and purification as following method: The samples of aspirin was dissolved in warm ethanol. Then the solution was cooled slowly, and the aspirin crystallizes out of solution leaving the salicylic acid and other impurities behind [9].

The samples identification:

The samples were identified by used **I.R** spectra and melting point methods. By compared the results with the standard spectra of aspirin in addition to melting point of standard values of pure aspirin.

RESULTS AND DISCUSSION

Melting point method:

The extracted aspirin samples was identify by comparing the melting point of the sample with the melting point of the pure aspirin the data are illustrated in the Table (2). The melting point values of the studied samples are nearly with the melting point value of the pure aspirin (136 .1 ^{0}C) , The relative decrease of some samples is mainly due some factors as presence of some impurities in the studied samples and / or due to some errors during the extraction as (Sample weight, sample dried and /or solvent effects) .

Table (2): The melting point values of the samples.

ASPIRIN SAMPLES NO	SAMPLE NAME	MELTING POINT ^{0}C
1	Aspirin 0.1	130.3
2	Aspirin 500	127.9
3	Aggrex	132.4
4	Jaspirin 81	139.2
5	Aspirin gastro	135.6
6	Aspocid	136.8
7	Dispearisble	134.2
8	Rivo	125.5
9	Jusprin 300	128.7

Infrared spectra Method:

The infrared spectra of the extracted aspirin samples were shown in Figures of (1- 9).
The samples I.R spectra gave the same peaks which reported in the pure aspirin sample.

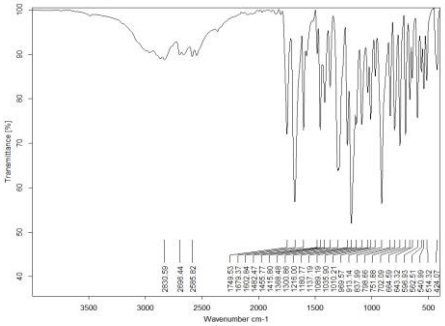

Figure (1): The I.R spectra of rivo aspirin sample.

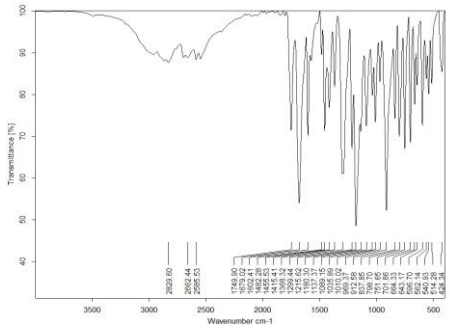

Figure (2): The I.R spectra of Juspirin 81 sample

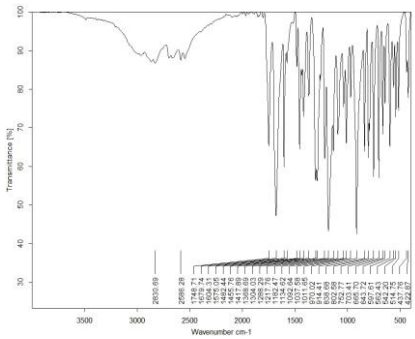

Figure (3) : The I.R spectra of Aspirin 500

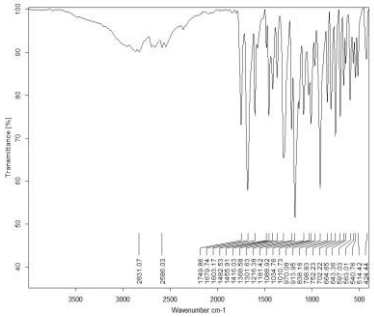

Figure (4) :The I.R spectra Aspirin gastro

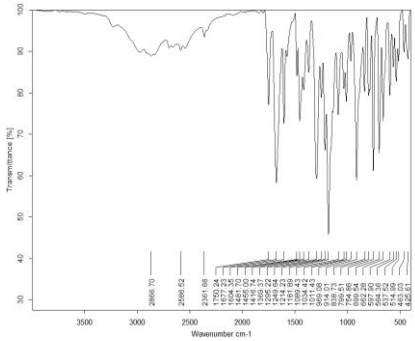

Figure (5) :The I.R of Juspirin 300

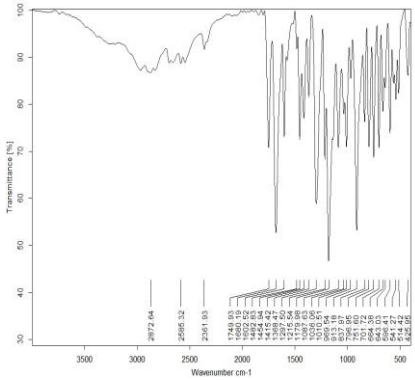

Figure (6):The I.R spectra of Aspocid

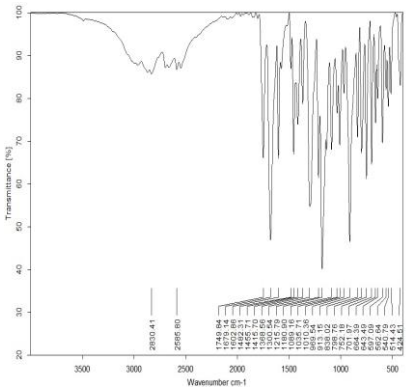

Figure (7) :The I.R spectra of Aspirin 0.1

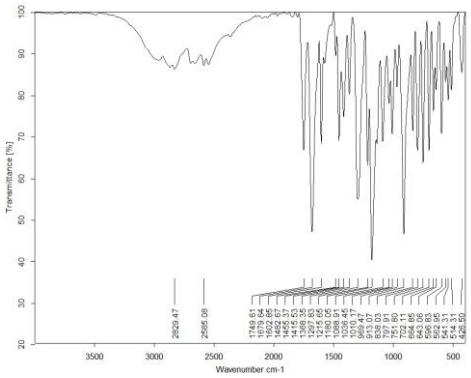

Figure (8) :The I.R spectra of Aggrex

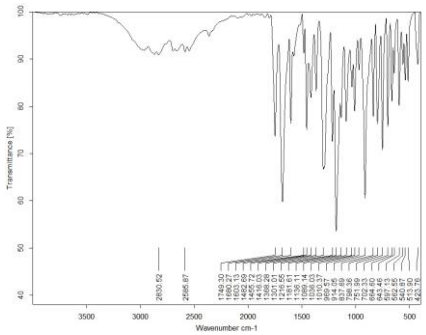

Figure (9) :The I.R spectra of Dispersible sample .

By comparing of the I.R spectra of the extracted aspirin from the studied samples with the I.R spectra of the standard aspirin spectra.

CONCLUSION

According to the applied methods which used in this manuscript the selected samples of aspirin are gave the same spectra of I.R comparing with the spectra of standard aspirin, also the melting point values of the current samples gave the similar values of melting point of standard aspirin, the relative increase or decrease variations of melting points for some samples mainly attributed to the effect of some errors of purification or extraction processes. Finally, this methods may be using during the quality control investigation

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