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Welding Technology By Using Electrolysis of Water Membrane Mixed Between Titanium Oxide and Aluminum To Save Energy

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ملخص :

كما هو معلوم أن تعديل سطح أغشية التيتانيوم وسبائكه نقطة ساخنة من البحوث الحديثة ، وأن استخدام أنوديك الأكسدة هي التكنولوجيا المتعرف عليه لتحسين أغشية التيتانيوم المستخدمة في اللحام بالماء ، وهذا الاستخدام له مشاكل عديدة خصوصا تلك الجراثيم التي تتكون على سطح أكسيد التيتانيوم وتضعف من وظائفه في اللحام ، لذلك جربنا خلطه بالألمونيوم لتحسين خصائص غشاء أكسيد التيتانيوم ، ووجدنا أن الخليط شكل أنسجة لينة ساعدت على النشاط الحيوي وكانت مضادة لجراثيم وموفرة للطاقة ولتكلفة .

الكلمات الدالة : تكنولوجيا اللحام – مضادات الجراثيم .

Abstract :

It is also known that the modification of the surface of titanium membranes and its alloys is a hot spot of modern research, And that the use of anodic oxidation is the technology recognized to improve the membranes of titanium used in water welding, and this use has many problems, especially those bacteria that are formed on the surface of titanium oxide and weaken its functions in welding, , So we tried to mix it with aluminum to improve the properties of the membrane of titanium oxide, and found that the mixture form soft tissue that helped the biological activity and was antibacterial and energy-saving and cost .

Keywords : Welding technology - Antimicrobial agents **.**

1.1 Introduction :

In the technology of thin-film for titanium oxide has contributed significantly to the development of various fields and various practical application, It is used in medicine for example to implant teeth and the distribution of bones because it is a non-toxic element and accepted by the human body, Titanium alloys are also used in aircraft and armored vehicles after mixing with steel to reduce carbon to protect rust, It has several advantages, including high heat resistance and corrosion and rust resistance , It is a titanium element to shine with a high density and high melting point estimated at (1668), However, titanium oxide is available in three phases in nature, the most important of which are the most common phase is (Rutail),as knowing that each phase has its own characteristics And its characteristics that mean (marinm, et al 2018) , Titanium oxide (TiO2) is used as a catalyst in the advanced welding machine used for

electrolysis of water and oxygen separation (O2) for hydrogen (H2) However, But when we put it down as a catalyst from three aspects is the first layer of bacteria and bacteria on the surface of membranes due to water, The water used was from the industrial river, These bacteria weaken the separation process and weaken the role of titanium oxide membranes, Second, in terms of cost, changing membranes under the use of this water requires changing continuously, Third, it was withdrawn for a large amount of electrical energy due to the weakness of the membranes after the Deposition of the bacteria on it, In this research, we tried several mixtures that did not work, but mixing titanium oxide with aluminum has made it transfer achieved a qualitative leap in the study, This is not new to mixing aluminum with titanium, The first mixing between the two materials was in the early 1950s, Knew as symbol (Ti-5Al) was characterized by significant improvement in the industries related to these two elements.

1.2 The importance of welding by using water :

In a scenario of the current technological progress , welding has become an essential necessity in all sectors. Where this technological system, in economic terms, has led to the interest in metal bonding with each other by welding, ,It was the prevailing view on the metal connection in the past was a craft rather than a scientific application, Over time the concept changed and became a forerunner in engineering science. And enough suffice it to denote a quick look at the most important metal installations in the modern age ranging from nuclear reactors, satellites, aircraft and ships to the lowest electrical appliances, In fact, they are metal components that have One of the most recently used been assembled together by different welding methods. methods is welding by water where hydrogen and oxygen gases are separated and packaged in an instant pressure cylinder inside the machine, And they want out for torch to the flame supply, The resulting flame is used in welding or any other applications, Thus, this method does not depend on the gases known in the welding and do not depending on them to generate energy from them, But produces its own energy self-explanatory by water, All that the device needs is normal electricity and water Or there is another way to use water also, which is direct welding as in Fig (1), However, the latter method consumes a large amount of electricity and does not have sufficient safety, which is not to be feared(seconhd,at al 2017).

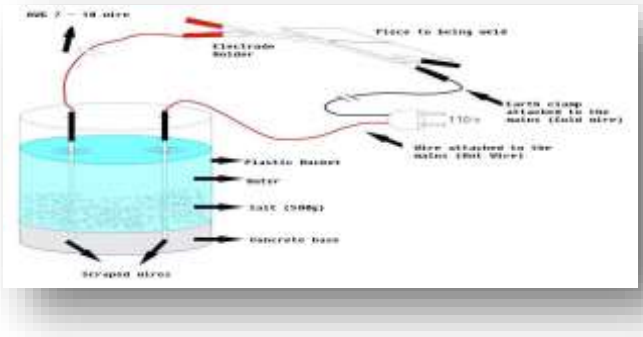
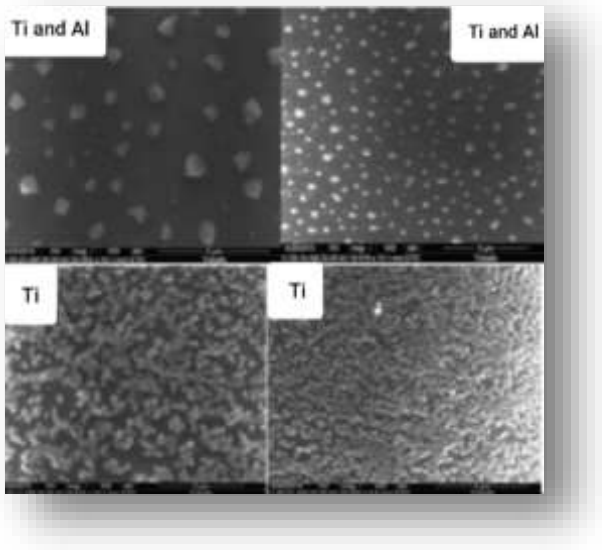


Figure (1) : shows direct welding method by using water

1.3 Development used :

It is also known that , the work ideas of the device for water analyzer for power generation that necessary for welding depends on the placental membranes of platinum and it is very expensive, So titanium oxide was used, It is also expensive but remains less expensive than platinum, As mentioned above, the use of titanium oxide membranes with water has negative aspects, So we added the aluminum powder with the membranes clearance of the titanium oxide so we found that the germs related to this molecule without affecting the membranes clearance and the soft tissue with it , As shown in Fig. 2, and thus we found a marked improvement in the bioactive activity of the membranes clearance, We also found a reduction in electricity consumption in this process due to the absorption of aluminum to the depleted or required energy from the membranes, And also with the repetition of the process we found that the cost of changing membranes clearance is few, This is due to non-damaged, All that is damaged in this process is the cleaning of membranes of aluminum due to the heat generated by the process of absorption of energy for titanium oxide membranes.



Figure(2) : shows the image of membranes before and after the addition of aluminum through the SEM device

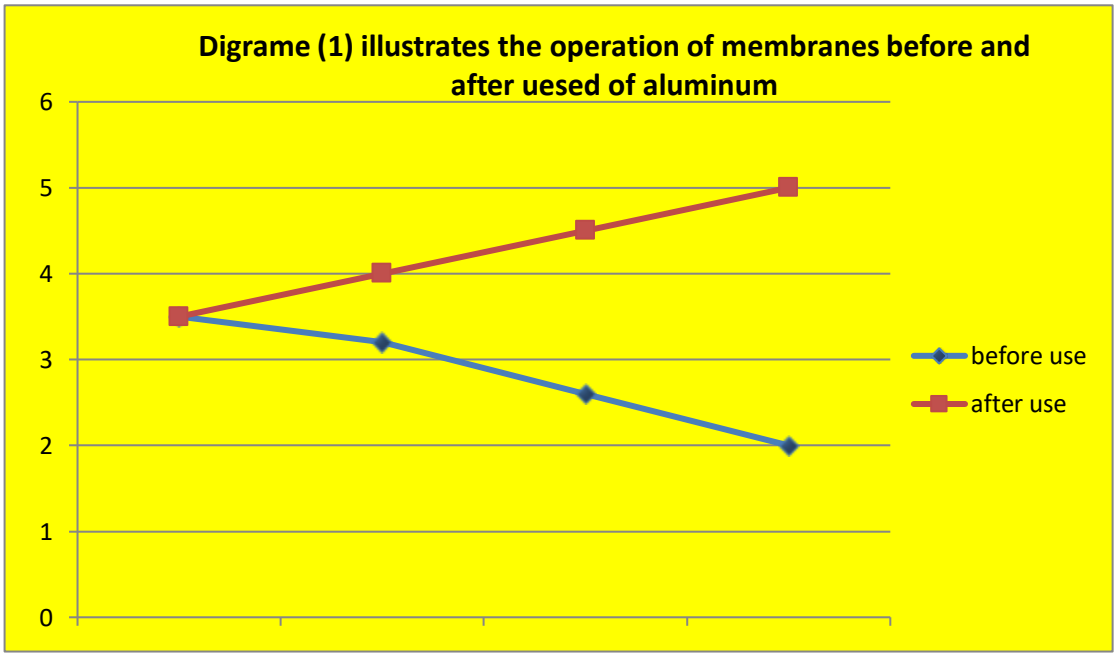
1.4 Results :

The results we have achieved are not on one level, but on several levels, the most important of which is to reduce the percentage of germs and bacteria related to the membranes of transpiration high rates, especially after the addition of aluminum as shown in the curve (1) The significant gradual decrease by certain percentages of the additions shown in Table (1), We have also been able to reduce the cost of changing membranes for titanium oxide because the addition of aluminum powder is inexpensive compared to what we mentioned Also, when the bacteria on the

membranes are clear, the device consumes electrical energy, which is twice as much energy as aluminum powder, and that is the most important thing, , curves (2) shows the current stream before and after the use of aluminum powder with membrane transpiration membranes in the device (gene,at al 2018) .

Table (1) : shows the ratios of aluminum additives on the clearance membranes

Quantity	Percentage	Remain	Repetition
18 Grams	20 %	hour	15
26 Grams	30 %	5 hours	15
30 Grams	33 %	7 hours	15



Note : The previous diagram illustrates the action of the titanium oxide transpiration membranes under the deposition of germs and bacteria on it and compared to the passage of time, It also explains its work after using aluminum powder, We notice an improvement in the functioning of membrane transpiration membranes here immediately, In fact, this reading came after many experiments to improve membrane functioning, But the result was incremental based on the increased proportion of aluminum powder.

1.5 Conclusion and Recommendations :

As indicated above, the use of aluminum powder and its addition to the transpiration membranes of titanium oxide are very effective and have many advantages, Since by adding them, we saved time, cost and, more importantly, electric power, Our recommendations are summarized in just one point:

• The specialized research centers and universities that contain scientific sections related to the field of welding and the oil companies have to focus in their research and in their projects on the development of this aspect of science, it is progressing every day and there is no field for delays, And it was matched, it is becoming more difficult than we imagine.

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