Flexible Temperature Sensors and Their Applications

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Abstract. The most interesting part of the sensor is the flexible sensitive part and irregular curved surface, which is different from the conventional surface structure and provides positive inspiration for many medical devices. These necessary conditions have become welcome items for medical care. Body temperature detection is an indispensable element of flexible temperature sensor, which is a symbol of identity. I think that with its growing popularity, we should better understand its performance and use. The degree of temperature response and the sensitivity of temperature to external stimuli will affect the use of the sensor. In my opinion, its appearance must be able to better help mankind. The following text will explain the current development status of flexible temperature sensors one by one.

Keywords: Flexible, Light, Temperature Sensor.

1. Introduction

With the continuous promotion and popularization of flexible sensors in recent years, more and more relevant articles have been published in the past decade [1]. Different from traditional sensors, their comfort and sensitivity are much higher than traditional sensors. The flexibility of the flexible sensor and the scalable equipment will have different effects in different fields. In recent years, with the development of science and technology, the main business scope of sensors has become more and more extensive, and it is gradually oriented to information engineering, food safety detection, etc. Reports in recent years show that it can even be used in firefighting areas. Its application is more and more extensive, and its future development will be more extensive. Human skin has many properties, but one of the most noteworthy is its skin perception. It has many functions for skin perception, such as predicting and preventing diseases in advance, and being able to quickly feel the surrounding environment information. In medicine, the temperature change of the human body is often inseparable from the correlation with some diseases, and it is often closely related to human health. It is also possible to quickly judge a person's health through these temperature changes. The sensitivity of the sensor is derived from the temperature of the human body. That's why it has such a significant effect on medical care. The temperature of the sensor usually keenly captures some subtle changes and can respond quickly. And for different problems, the sensor can do specific analysis, surprisingly, these analyses are often stunned and extremely correct. In subsequent research, its skills have been continuously developed, and so far, the temperature sensor can no longer fit the human skin, and make accurate human temperature judgments, which must be amazing [2].

But this is not omnipotent, and there are exceptions to any machine, which is not suitable for children, because children's blood flow is faster than adults, so it cannot keenly capture children's blood temperature information.

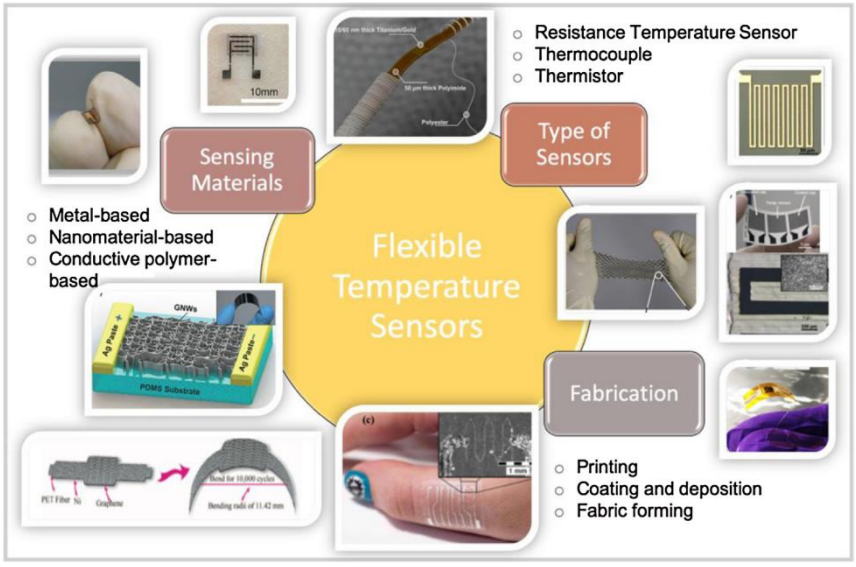

Figure 1. Temperature sensors overview.

2. Electrical stimulation

The design principle of the sensor is actually very close to the physical relationship, and it is used for the principle of thermal expansion and contraction, so that the metal part expands or shrinks, which is the design principle of the temperature sensor. It is inseparable from temperature, and there are different changes at different temperatures. There is a section of the temperature sensor called the bimetal. The bimetal is an important part of the sensor. The choice of bimetal is very particular, and two pieces of metal with different densities and degrees of expansion are bonded together to make different reactions for different environments. When the signal of temperature change is, two different pieces of metal will emit different degrees of contraction, which is the signal given by the sensor to temperature change. The more elastic they are, the greater the temperature variation. This output signal is not only simple and straightforward, but also very simple. It can give answers more intuitively.

2.1. Sensors designed for deformation curves of liquids and gases.

There is another auxiliary function for the temperature sensor, which can better help the sensor to convey temperature information. It is well known that temperature changes affect the volume of liquids and other substances. When the volume of various types of substances has changed, the output position of the temperature sensor will also change. Such as the electrode plate, induction value, etc. There are different categories of temperature, such as soft temperature. The use of soft temperature as its name is very soft and delicate. It can predict the information in advance to the greatest extent, which can protect the stability of the internal current state and the current state of heat-sensitive electronic devices to the greatest extent. This kind of temperature sensor is the most suitable for the robot, and it can cooperate perfectly with the robot. But it differs greatly from the materials used in conventional sensors, such as polyethylene, which uses a low molecular weight, conductive material. Low molecular weight polyethylene material can better achieve the physical effect of thermal expansion and cold contraction, more sensitive to temperature. It will also have enough space to control information when temperature changes the volume of other substances. But in order to keep the current stable. This type of sensor has a stable resistance. The resistance is used to locate the thermal response. Many of these sensors are not developed enough, after a series of changes, only through the external force can be restored, internal force requirements are still defective. In mechanics, the principle of the thermal sensor has a corresponding role, it gives full play to the content of mechanics. This is also a relevant attribute for human research. When the human body is injured, the bones of the human body will be in the mechanical, in the mechanical recovery, the human body can

be restored. About the famous Glenborough method, many polymers can adapt to thermal response, so these materials are preferred. But different ratios and different densities will give different results [3]. For the transmission of temperature signal, temperature sensor is very sensitive and suitable. At its core, the technology is tight and smart. We have different ways of measuring depending on how we measure it. No contact and contact we should be measured differently. It's not just the different measurements, the different materials, the environment that we need to consider.

2.2. Temperature Sensor Based on Structured Temperature Sensitive Metal Materials.

A lot of clinical operations on temperature sensors are already underway. The research of flexible temperature sensor has been taken to the next level, which is the most practical way for the development of flexible sensor. Depending on the degree of oxidation, the chemical reactions that can be received vary greatly. Because the reaction of the electrode layer varies with the degree of oxidation, controlling the oxidation reaction is an essential step to obtain accurate answers. The design of the silver ring on the top layer will be completely consistent with the sensor at the induction Angle, to achieve the ideal information. In such a sensitive sensor, the advantages of the traditional sensor opened a big gap. Temperature sensors will be more agile, cheaper to manufacture and less heavy [4]. It can reduce the wear and tear during communication and is more durable than traditional sensors. And can put all the materials to the best use in a particular location. This is the biggest advantage of temperature sensors. But at different scales, there are different parameters. Anywhere from 20 to 60 is a good range. When the measurement range continues to improve, adding resistance can better experience the stability of the sensor, which is a factor that must be considered for high performance.

2.3. The role of temperature sensor in medical treatment

Medical care plays a vital role in the development of modern society in the health of human beings. It is closely related to human health, with the continuous research and application of medical equipment, the current sensor has a great contribution and help to the treatment of the nervous system, it can not only be implanted into the nervous system but also can not affect the formation of genes. In some small areas, it has its advantages, for example, it can isolate harmful gases, can improve friction, and will have higher flexibility than traditional sensors. Its flexibility is so high that objects as small as 0.5 mm can be wrapped around it effortlessly, a standard that is a step forward over conventional sensors. In the treatment of medical diseases, especially for the treatment of tumors, it left a vital role and assistance, and its emergence helped many people suffering from illness [5].

3. Temperature sensors based on other temperature-sensitive materials.

For the research of new sensor materials, experiments that have not yet reached the clinical stage, who will make professionals prohibitive of such a difficult thing, often can only stay in the combination of success. For further use, it remains to be tested. There are different ways to deal with and process the sensors of different devices, such as manufacturing the conductor part of the electronic skin, and the poles of the battery have different functions. For the self-healing ability of some positions, the current science and technology may not be able to achieve, and it has yet to be discovered. For the study of human skin, continuation, it has a volatile and stress test inspiration for the sensor, so that this part has also been better experimented, and made a good preparation for the subsequent auto-retractable equipment. In a metal handle, different forces determine different variations. In general, some variables are less likely to occur in the wider part of the metal, and the indicators will be more stable. Conversely, in the narrower part of the sensor, when the pressure changes, the relevant index also changes [6]. These will be measured using the contact measurement method mentioned earlier. Different digital parts have different machines to control. The difference in a voltage reading is that the program at the beginning of the sensor is customized, and the auxiliary effect is determined by the number of resistors in the sensor when the current stabilizes and the

ambient temperature at that time. For some classic problems, the solution is to continuously adjust the number of exposure cycles and wire winding, and the general time modulation to five minutes to fifteen minutes is the most reasonable adjustment span. Another important factor is the nitrogen content in the air, if the nitrogen will increase four times in a row, then the next control will use professional dilution equipment to adjust the nitrogen in the air [7]. It is also a good way to use a dehydration bath to detect the temperature sensor, and the calcium chloride in the dewatering bath cannot affect the resistance when the temperature rises, thereby maintaining the stability of the current in the sensor. If you are afraid that readings will be affected by rising temperatures, then using an isolation mask is a good choice, at 45 degrees Celsius, the best state of resistance and electrodes [8].

4. Conclusion

In fact, the flexible temperature sensor is not enough to describe a single, it is a combined sensor, multi-functional sensor [9]. In temperature, environmental quality detection, biological changes play an extremely important role. It's more agile and convenient than traditional sensors, and it's easier to wear in terms of biological detection functions, and it's also better at detecting multiple human skills when it's close to the skin. But there's more to it than that, and maybe there's more to it than that and there's more to it than that and there's more to it than that. In the process of wearing such sensors, we can see different values as the energy of small substances changes. When these energies are collected, they can be better converted and used to avoid energy waste [10]. This is a very important process on the way to integration. During the operation of such sensors, they are constantly subjected to physical stimulation, which is a way to check whether they are stable. At present, the sensor connection mode still needs to be improved, only to improve the power level, power generation level, the sensor can enter the next stage of development. Considering the comfort of wearing it, if it can be perfectly integrated with some clothing textile materials, then its popularity will be greatly increased. The development of sensors is a huge potential development project for the future, and it can open even more areas that will surprise us.

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