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Plasma technology trend in Korea

Jeong Eun Ha, Officer for Innovation, Technology and Science, May 2, 2017

Introduction

Plasma research in Korea first began in 1970s when there was an oil crisis in the major industrialized countries such as the United States, Western Europe and Japan. This incident has led many of the industrial countries to start developing alternative energy sources such as nuclear fusion energy. Seoul National University was the first organization in Korea to jump into this research and developed the Korea's first plasma nuclear fusion reactor called SNUT-79. Ever since then, the Korean government is continuously supporting a number of national research institutes to obtain core plasma technologies and to be competitive in the world. Two of the recent developments in Korea are the development of plasma fabric technology and plasma agriculture technology.

Wearable Plasma Fabric Technology

Wearable Plasma Fabric technology is developed by the Agency for Defense Development (ADD). This wearable atmospheric pressure plasma fabric is a flexible wire electrode which can be knitted flexibly and can decontaminate chemical warfare agents. It has gained international attention as the ADD's development can be bent or flexibly knitted. It is innovative because the conventional reactors only use rigid and flat electrodes, so it is not possible to apply at curved or three-dimensional structure. The Korean researchers are going to develop plasma blankets that can decontaminate toxic agents. This will be used for soldiers undergoing chemical, biological and radiological (CBR) training. Furthermore, this fabric can be used to sterilize wounds and can also be used in medicine and the beauty sector.

Source: ADD

Plasma Agriculture Technology

Jeju Special Self-Governing Province Agricultural Research & Extension Services has begun a demonstration test to improve the quality and storability of hanrabongs (orange from Jeju Island) by applying the plasma agriculture technology which can restrain the formation of putrefactive bacteria in tangerines. The purpose of this test is to increase the income of farmers by maintaining and extending the expiration date and dispersing the shipment and sales of hanrabongs. In order to optimize the freshness, the amount of plasma and the temperature can be changed depending on the types of agricultural products. Since 2015, the organization has also completed the tests on broccoli, pumpkins and red cabbages.

Plasma Technology Research Center at the National Fusion Research Institute

The National Fusion Research Institute (NFRI) is the leading research organization in Korea that has a Plasma Technology Research Center. It acts as a hub of plasma research not only in Korea but also in other countries. As the plasma technology is applicable to various industrial fields such as bio technology, nano technology, and environment technology and so on, the center is researching various industrial fields from basic research to industrial application research. Their main purpose is to lead the plasma technology internationally by obtaining original technology and application technology. Furthermore, the research institute supports SMEs to transfer plasma technology to commercialize cutting edge research and development results.

NFRI is actively cooperating with foreign research institutes. They also made a cooperation agreement with UT Eindhoven in 2012, and they are open to cooperation opportunity with foreign knowledge institute to further develop plasma application technology.

Source

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