

ROLE OF PLASMA IN RECENT ADVANCES IN PHYSICAL SCIENCE.

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ABSTRACT:-It is well known facts that plasma is universal property for material and space. Plasma science and technology is one of most important fundamental aspect for advances in physical science. The role of plasma science which has mostly concerned about the entire field of science and technology. Today is the age of plasma science which has related to society, socioeconomic, industrial, micro-electronic, medical and surgery treatment, tele-communication, remote sensor, fiber optics, GPS, stars, interstellar space program, agriculture and harvesting, pesticides-medicine, chemical engineering, potential and current, semi conductor, p-n junction, energy bandgap.

Research of all around field such as fusion energy, impurity water, cancer detection, ores mineral, petrol chemical, new species on the earth and planets. The important point has been focused on the crisis of energy as population increases. But the source of energy does not fulfill the demand of nation. So, it is challenging problem for physical science. The different manifestation of plasma are responsible for all technology revolution, green revolution, nano-technology to check up density and temperature rise and fall orderly in free environment in india. The aim of this paper mainly focused on the application of plasma science and technology to new way methodology and research, technique and programme, skill and mindset of future science and technology in recent advances in physical science. The application of plasma build up chips, IC, clean of toxic waste in environment.

KEYWORD: plasma, EWM, fusion energy.

1.INTRODUCTION:-Infact, plasma is universal property of material and space. Such solid state of material can change liquid and as sudden gases. So a plasma is sometime defined as gas that sufficiently ionized to transits and plasma like behaviour. This type of behaviour of gas has under gone ionization and dissociation process. The resulting gaseous has 4th state of matter that excited molecules and atoms, radical, positive ions as well as negative species(ions and mostly electrons) species in a neutral specified gas. Initially, Irvin Langmuir in 1927 described and ionized gas. Again, Irvin Langmuir in 1928 suggested that special mixture term plasma. Most of visible matter in the universe is infact in plasma state. Such all type of material is composition of plasma as interior of stars and interstellar matters. It is apart from these naturally occurring plasma. Sometime a plasma are man-made and can

produce lightening and flames. Again, the application of plasma is very wide range such as modification, environmental remediation and also in biotechnology and medicine. In general, popular association with plasma technology is usual limited to high temperature used for controlling and harvesting energy from nuclear fusion and fission process. The activity and shape of plasma may change every in material and space and enhance comprehensively and ubiquitously. Now these days development of plasma in television set have caught consumer attention and also contribution of plasma processing steps remains hidden and their vital role is not obvious. Now again, we improve different field and the step involved in manufacturing of micro-electronic circuit, micro-processor, fluorescent lightening tube, energy saving bulbs. Such plasma process still play an important roles in fabrication of these different devices. Plasma generally modify and enhance property and functional activity of material and cover a range from preparation of plastics for printing. However plasma can further stepping to improvement of optical communication, reading glasses, decomposition of chemical pollutants and harmful micro-organisms in air and water. Initially siemen in 1857, who had proposed the concept of application of plasma and still used today. Many more area of plasma application is under research and modification in different field. The importances of application is only possible by utilizing the unique property and interaction and mechanism that are provided by plasma. Moreover, technology exploit plasma are almost exclusively generated in gas discharge and is energy provided to an operating gas by an applied electric field. With partly dissociate and partially ionized molecule and atom. Infact that the mix of species and property are determined by the operating condition. Specially, electron and kinetic play an important role which particular in different ionization activation, excitation process and can by themselves induce unique characteristics. Finally, plasma technology may change scope and area of entire field such as industrial technique of manufacturing process, fabrication of electronic devices, air-pollutant, toxic waste material in free environment. Day-to-Day improvement technique process and program to modify new way research and innovation.

2. APPLICATION OF PLASMA FIELD AND TECHNOLOGY:-

The most up-to-date application, fabrication of semiconductor and integrated circuits wouldn't be attainable with plasma technology. Now intrinsically is that the measure and wealth might supported micro-electronic and data technology. Anyway it's directly or indirectly associated with improvement and concern to plasma etching, plasma deposition and plasma bonding techniques. In the mean solar time options of solely some nano-meter are often inscribed over the depth of over 1 micro-meter and film deposition management within the vary of angstrom. The plasma process techniques in semiconductor producing square measure usually operated at low. The role of plasma technology and their impacts ensuing from utilization of plasma technique. Again, the different space benefited from the distinctive properties and characteristic of plasma.

2(a) : - AREA OF ENERGY AND POWER FIELD-

It is most common and initial aspect and program for socio-economic society. Now the plasma phenomena play a key role in high voltage production, arrangement technique and power distribution. Again thermal plasma and in particular high current arc and their interaction with the wall of containments has enabled considerably of circuit breaker techniques. Plasma is based on fabrication technique are crucial for development of novel energy and generation and system membranes for fuel cells or photovoltaic semiconductor elements. Anyway plasma directly or indirectly are also responsible for significant energy saving in LED (light emitting diode). Plasma technology has to develop to be more efficient and economical. The use of plasma process for production of new materials of hydrogen technique, energy conversion and storage where efficiency increases and upscaling are required in addition to providing to unique material properties. Now improved process for plasma coating or sphering of protective layers, hardening and nitriding and polishing as well as activation.

2(b): - AREA OF OPTICS AND GLASS FIELD=

This type of material is one of the best area for development of new field. Now the treatment of modification of glass and optical material has been rapidly growing in area of research. Since, advance industry program to move in this field and adoption of some process was initially motivated by the success of low pressure plasma technique in microelectronics. In addition to providing and precise and small micro and nano structure, reason for modification are improving abrasion, erosion, hardness, adhesion and other field. The main goal of plasma technology are not limited to treatment of glass but are also applied to plastics. In other cases, optical component is also developed fibre optics and is used in communication and photovoltaic or torch panel.

The application of glass-optical field is wide range of development in controlling, nano material generation i.e graphene or gold. Again the use of plasma as an optical element itself and the goal of replacing conventional lenses and mirror for electromagnetic radiation with frequencies from the visual to terahertz range in particular for radiation and beam of high intensity. It is not used in certain area of field but also enable new application such as communication, sensing, imaging, cavity of super resonance of highly selective frequency filters, foxing and also miniaturization of appropriate plasma sources and operation at atmospheric pressure.

2(c): -AREA OF AUTOMOTIVE AND AEROSPACE FIELD-

The aspects of plasma, we attention on the application of aerospace and automotive industry may not be defined clearly. Here plasma technology can also be used in particular to prepare superior varnish or harder but light weight turbine blades such material usually powered that injected into hot thermal plasma stream are heated or molted and their

spray on to a surface. More further break through using plasma are also anticipated for air borns and space based application. Plasma actuators are expected to reduce drag and therefore fuel consumption and plasma thruster have received for novel propulsion concepts for satellites or even space crafts.

Plasma methods play a key role with development of new material, modification of material and **SOME** of material adhesive or welding technology. Plasma technology has been extensively studied to remove nitrogen oxide and sulphur dioxide from exhaust gases in free environment and to be remove frequently.

2(d): -AREA OF PLASTICS AND TEXTILE FIELD-

The new source of plasma are successfully used for processing natural fibers such as wool or cotton. Now the treatment and modification of plasma preferably at atmospheric pressure, impurities can be removed and the water absorption of fibers promoted. Again however many modern textile are more from polymers or atleast include polymer fibers, consequently they are used in a wide variety of commercial application for plastic and textile. It is rare that polymers material with desirable bulk property also possess the surface characteristic required for certain specific application. Finally, the ability to perform control surface engineering polymers is considerable professional and scientific importance. The application of low pressure plasma for the industrial treatment of commodity plastics and fabrics are limited. Again there has been strong desire to move away from low pressure plasma technology that need expensive and limited volume vacuum equipments towards atmospheric specification.

2(e): -AREA OF ENVIRONMENTAL FIELD-

Environment is one of the best aspects of modern society. Plasma technology is already playing a major role in air and water pollution, Now the generating ozone by dielectric barrier discharged is most important scale to purify water pollution. Again pollutant in exhaust gas stream are also already frequently abated in filtration now available to eliminate odour especially in kitchen. These main aspects and potential of non thermal plasma for environmental remediation and production are summarized in a recent white paper in the future of plasma science in environment. The important area under development area include using plasma with adsorbents and combining plasma with heterogeneous catalyst. Again this way it will be possible to increase efficiency and application range of current technology. Now the combination with other established and emerging technology such as integrating plasma may directly in filters and for not only retaining simultaneously regradation of compound plasma field either chemistry or physical science con version of substance.

CONCLUSION:-

The view of this paper mainly focus on the area of application in different field is most important aspects and high value of socio-economic awareness. The plasma science and technology has been improved and played a key role in advancement of all area of field. All around the world the mainly focus to development of energy program, agriculture, medicine, space program, medical devices, toxic waste, plant pollution control system and resources in further field in research and innovation. The plasma action relies on combination of plasma generated constituents reactive species, ions, ultraviolet radiation. The area of non thermal plasma processing of semiconductor and micro-processor have already result in commercial application. The important role of plasma processing often remains hidden in the value of final product and crucial role in their fabrication. Finally this review of paper of the fact that plasma is one of the fruitful concept to I prove the research program in different field of societal world.

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