

Air Mass Can Be Cleaned Up Through New Fusion Breakthrough

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Abstract

Fusion reaction is the nuclear process in which two lighter nuclei fused together to form heavier nuclei and releasing vast amount of energy.

Fusion is the same nuclear process that powers the Sun and others stars. It essentially involves two atoms joining or fusing together to form an atom of a heavier nuclei of an element.

Inside the Sun two hydrogen atoms fuse together to form one helium atom.

A miniature experiment recently carried out in US has brought new hope of generating electricity through nuclear fusion reaction.

KEYWORDS: Fusion, reaction

Introduction:

Fission and fusion are two different types of nuclear reactions that produce energy.

Fission based power plants have been operative since fifth decades of this century. India have developed many indigenous nuclear fission power reactors since post-independence era.

Scientists are working very hard to generate energy through nuclear fusion reaction in the reactors. Nuclear fusion energy is considered to be safe, abundant, clean source of nuclear energy.

If this energy is abundantly generated then the dependence on fossil fuel will be very less as the fossil fuels are creating world-wide pollution and global climate crisis.

Recently California based Lawrence Livermore national Laboratory (LLNL) achieved a net energy gained from an experimental nuclear fusion reactor which can change the direction of research and can prove a great breakthrough for future energy generation.

For the first time scientists have been able to produce more energy than it consumed.

The recent discovery can be utilised in commercial power plants to generate large amount of energy and utilise this energy in commercial way throughout the world.

Theory and discussion:

Binding energy is the root cause for nuclear fission and nuclear fusion reaction. Binding energy put protons and neutrons together in the nuclei of an atoms, when released, tremendous amount of energy is liberated.

In nuclear fission reaction, splitting of heavy and unstable nuclei takes place into two smaller nuclei .In nuclear fusion reaction process two lighter or smaller nuclei fuse or joined together to form more amount of energy.

The Uranium, which is very costly fuel is usually used in nuclear fission reactors. Also Uranium is not commonly found in the nature hence very costly.

When Uranium atom is bombarded with very fast moving neutrons, it breaks into nuclei of elements like Barium and Krypton with release of series of next generation neutrons in the process.

The generated neutrons split more Uranium atoms by exciting and breaking nuclei which causes the unending chain reactions.

The vast amount of energy generated is utilised to boil water for generating steam energy.

The biggest problem about the fission is some of the by-products remains radioactive for many years and can cause environment hazards. Accidents that takes place in nuclear reactors also can release radioactive material into the environment for longer duration. The Chernobyl 1986 and Mile island accidents can reminds the world of disastrous hazards that had disrupted normal life and amassing casualties in that region.

With more than 400 reactors worldwide we are creating 10% of the total electricity with the help of nuclear reactors.

More than fifty countries use nuclear energy in about more than two hundred research reactors are working for making medical and research isotopes.

United States of America has 92 nuclear reactors and is the largest manufacturer of nuclear energy and hence nuclear power.

More than thirty percent of the total electricity is generated through nuclear reactors in U.S.

Nuclear fusion can generates manifold energy and nuclear power as compared to nuclear fission and that without producing hazardous bye-products. The problem however lies with the controlling and very high pressure and about million degree temperature that is needed in nuclear reactor for fusing the lighter nuclei.

To generate more than one hundred millions degree temperature is a challenging and tough task, also how to prevent the energy loss in the form of tremendous heat is beyond ones control.

Once the reactor is active, it can generate uninterrupted energy continuously without any hindrance and interruptions.

The nuclear fusion energy is carbon free, and can bring down atmospheric pollution and hence climatic change throughout the globe. Since fusion reactor requires abundant Hydrogen which can be made available anywhere in the nook and corner of the world hence a fusion reactor can be setup anywhere in the world.

According to scientists cold fusion can be possible to bring out alternative results as of the hot fusion, which may require less temperature as they have calculated. Scientists are of the opinion that cold fusion is also possible even at room temperature.

Stanley Pons and Martin Fleischmann in 1989 had researched that their apparatus had produced anomalous heat i.e. abundant heat that was only possible with hot fusion. The by-products like deuterium and tritium are found produced in the reaction.

The miniature experiment is found the electrolysis process of heavy water made up of Hydrogen atoms on the surface of Palladium electrodes.

The experiment can be replicated to produce abundant amount of energy.

Fusion technology can be invested for energy generation by big industry people throughout the universe. Even World Bank and private financial banks can support such projects for the benefits of mankind.

The fusion industry believes that more than ninety three percent of companies responded to a survey believes that fusion power will be generating electricity into power grid by 2030.

The total three billion dollars capital has attracted by companies as compared to two billion dollars last year.

Conclusion:

The latest experiment that has been carried out in U.S. are aroused new hope of generating electricity through nuclear fusion instead of nuclear fission .The future energy will be carbon free,non-hazardous and in other words it will be environment friendly. The industry is also eagerly waiting for actual generation of power for feeding to electric greed for useful electricity generation. It will be the source of clean and pure energy.

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