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Hydrogen: A Green Fuel

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ABSTRACT

Today as Environment has become the most crucial aspect of the world and considering that it is necessary to protect the environment in terms of every field. So, for automobiles, Hydrogen can be an alternative fuel that is environment friendly and which has a byproduct i.e. water, which is drinkable.

Key Words-: **Hydrogen, Fuel, Green Fuel, Byproduct water, Carbon Fibre, Tensile strength, Electrolysis, Solar energy, Mileage, no House gas emissions, Environment friendly, Low Cost, Etc.**

1. INTRODUCTION

India is a country with a mixed economy i.e. it depends on both aspects i.e. Capitalist and Government. Besides that transportation plays the most crucial role in enhancing the economy of India. So, considering that there are various laws in automobiles concerning emissions and the environment. So in this 21st-century environment is an important aspect all over the world, Keeping that in mind Hydrogen can be the best alternative fuel compared with gasoline i.e. Petrol and Diesel. As hydrogen has no emissions the byproduct produced after using hydrogen energy is water which we can drink literally.

1.1 Why Hydrogen can be the alternative to gasoline?

1) As discussed in the introduction it does not lead to any emissions, so, low emissions.
2) It is a highly combustible gas so the energy produced by hydrogen is in massive amounts.
3) When hydrogen releases energy its byproduct is water.
4) The extraction of hydrogen from water is possible with the Electrolysis process.
5) The energy released by hydrogen can be considered to be best in terms of mileage.
6) Hydrogen releases three times more energy than gasoline and eight times more energy than firewood.

So, considering all the aspects above mentioned it sounds very easy to use hydrogen as a fuel. But, it is very difficult or we can say it is impossible to transport hydrogen from one point to another. As above mentioned, hydrogen is a highly combustible gas and it can only be stored in gigantic tanks when it is in liquid form or can only be held in a very high-pressurized vessel when it is in gaseous form because hydrogen is a colorless and odorless gas in atmospheric pressure if there is a leakage or something it cannot be detected with human abilities and it can be a very dangerous disaster in the history of mankind.

1.2 What can be done to store hydrogen?

As earlier mentioned, hydrogen is a highly combustible gas, so normal tank gas can easily be blasted as they have low tensile strength. Therefore hydrogen gas leaks when stored in normal tanks or cylinders. So to deal with this we should have a material with large tensile strength.

Carbon fiber can be used to store hydrogen as it has high tensile strength. It is also used in the aesthetics of the automobile. But the cost of carbon fiber is very high around 250mm x 250mm x 1.5mm sheet of carbon fiber costs around 1800 INR. So the cost will be way to much high.

2. Any other alternative possible to store Hydrogen or to produce hydrogen?

The answer to the above question is YES, There is an alternative way to produce or we can say to extract hydrogen from water i.e., the Electrolysis process. By using two electrodes, water, and Electricity we can separate hydrogen from water. For more efficiency, we can also add Nacl i.e. Common salt. Salt will act as a catalyst and will make the whole process fast and efficient. By placing a membrane between the electrodes, the hydrogen will accumulate within the membrane.

2.1 What if the above Electrolysis is made solar-powered?

We can also make the electrolysis process solar-powered by providing the system with a silicon plate, to absorb the solar energy connecting to the Photovoltaic cell commonly known as a solar cell.

3. CONCLUSIONS

We can conclude that as technology and the human mind are developing at a high rate there will be various alternatives for hydrogen use as a fuel. There will be various alternative techniques to deal with storage, cost, and transportation of hydrogen. But if we can deal with the current scenario and look at it at a larger horizon then probably it is possible to use hydrogen as an alternative fuel and consider it a Green Fuel.

REFERENCES

1) *"Toyota's Fuel-Cell Car Mirai Goes on Sale". The Wall Street Journal. 15 December 2014. Archived from the original on 26 May 2018.*

2) ^ Jump up to [a] [b] [c] *"Toyota to quadruple production of Mirai fuel-cell vehicles by 2017". The Japan Times. 23 January 2015. Archived from the original on 6 July 2015.*

3) ^ *"Toyota Unveils 2015 Fuel Cell Sedan, Will Retail in Japan For Around ¥7 Million". transportevolved.com. 2014-06-25. Archived from the original on 2018-11-19. Retrieved 2014-06-26.*

4) ^ *"A portfolio of power-trains for Europe: a fact-based analysis" (PDF). iphe.net. Archived (PDF) from the original on 15 October 2017. Retrieved 15 April 2018.*

5) ^ Jump up to [a] [b] *"Toyota Mirai x Hydrogen: the world's first mass-produced HFCV". 20 January 2017. Archived from the original on 16 May 2022. Retrieved 8 March 2023.*

6) ^ *"Planes running on batteries and hydrogen to become a reality under the new group of aviation experts". GOV.UK. Retrieved 2022-05-18.*

7) ^ *Frangoul, Anmar (2022-02-17). "Airbus CEO says hydrogen plane is 'the ultimate solution' but cautions a lot of work lies ahead". CNBC. Retrieved 2022-05-18.*

8) ^ Jump up to [a] [b] [c] "Realising the hydrogen economy", *Power Technology*, 11 October 2019

9) ^ Jump up to [a] [b] Romm, Joseph. Tesla Trumps Toyota: Why Hydrogen Cars Can't Compete With Pure Electric Cars" Archived 2014-08-21 at the Wayback Machine, ThinkProgress, August 5, 2014.

10) ^ *"Wind-to-Hydrogen Project". Hydrogen and Fuel Cells Research. Golden, CO: National Renewable Energy Laboratory, U.S. Department of Energy. September 2009. Archived from the original on 26 August 2009. Retrieved 7 January 2010.* See also Energy Department Launches Public-Private Partnership to Deploy Hydrogen Infrastructure Archived 2014-06-07 at the Wayback Machine, US Dept. of Energy, accessed November 15, 2014