Hydrogen Cars Reading Passage

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A. Due to record-high gasoline prices, road trips are more expensive than ever. But what if your car ran on the most abundant element in the universe instead of gasoline? Hydrogen will eventually replace gasoline, diesel, and natural gas as the primary fuel for automobiles, buses, and trucks, according to numerous experts. Global automobile manufacturers have already invested billions of dollars in research and development.

B. The benefits of hydrogen are enormous: no smog-forming exhaust gases, no carbon dioxide emissions that contribute to global warming, and no concerns regarding diminishing oil supplies and rising prices. Before mass-produced hydrogen vehicles can hit the road, however, a number of challenging questions must be answered. Where will the hydrogen supply originate? How will motorists fuel up? How will automobiles store fuel? There is also the question of how to optimally utilise the energy in the fuel for optimal performance on the road

C. Hydrogen can be used as a fuel in two types of engines: those with a converted internal combustion engine and those with a stack of fuel cells. Automobiles have been powered by internal combustion engines for more than a century, when they replaced horse-drawn carriages. These engines are compatible with a variety of fuels, including hydrogen. However, the majority of automakers consider fuel cells powered by an electric motor to be the superior option. In contrast to heavy batteries that must be recharged frequently, fuel cells generate electricity as they move. Recent technological advancements have substantially increased a cell stack's power output. This has paved the way for electric vehicles with low emissions.

D. Fuel cell technology seems straightforward. This is the opposite of the well-known electrolysis process, which releases oxygen and hydrogen from water. Obviously, it is somewhat

more difficult in practise. Efficiency is the primary advantage of a hydrogen-powered internal combustion engine over a fuel cell engine. Using the same quantity of hydrogen, a fuel cell vehicle can travel at least twice as far as an internal combustion engine vehicle.

E. Although hydrogen has numerous advantages as a vehicle fuel, it is difficult to store. This is due to the fact that hydrogen is a gas at normal temperatures. The obvious solution is to compress or liquidity the hydrogen. On the other hand, tanks designed to store hydrogen at extremely high pressures or temperatures close to absolute zero are cumbersome and expensive. Consequently, the primary disadvantages of refueling with liquid hydrogen are likely to be the high cost and the substantial amount of energy required to liquefy the fuel. Although compressed hydrogen gas refueling may reduce the distance between fill-ups, it is more practical. Hydrogen could be stored in automobiles in high-pressure tanks comparable to those used for compressed natural gas, or in carbon that has been specially treated.

F. Although there is no risk of Hydrogen depletion, it occurs naturally on Earth only as chemical compounds and not as Hydrogen gas. At central plants or filling stations, hydrogen gas for automobiles can be produced by steam reforming, a relatively simple technology. Alternatively, gasoline or methanol could be used in the tanks, with reformers onboard producing Hydrogen for the fuel cells. While research into hydrogen storage issues continues, this interim solution appears promising. Hydrogen's only potentially pollution-free source is water. Utilizing algae, bacteria, or photovoltaic cells to absorb sunlight and split water into Hydrogen and oxygen are a few of the new methods being investigated to produce Hydrogen from water. However, electrolysis, which uses an electric current to separate water into oxygen and hydrogen, is most likely to be adopted on a large scale.

G. 'Remember the Hindenburg.' - This is a common phrase when referring to Hydrogen. In May 1937, this German hydrogen-powered passenger airship crashed as it approached Lakehurst, New Jersey, United States. There were 35 fatalities. Helium, a noncombustible gas, is the fuel of

choice for lighter-than-air aircraft at present. Despite the fact that hydrogen is extremely flammable, recent research suggests that the Hindenburg disaster was caused by the airship's fabric, not hydrogen. There is no reason to believe that hydrogen is a more hazardous fuel than gasoline, the explosive liquid currently stored safely in the tanks of countless millions of automobiles.

H. Recent technological advancements, particularly in fuel cell design, have made hydrogen-powered automobiles a viable option, with automakers expecting mass production to commence within the next decade or so. Their power and acceleration should be comparable to conventionally-powered automobiles of today, but they may require more frequent refuelling. The optimal strategies for producing, distributing, and storing hydrogen are still under investigation. Short-term, fossil fuels may continue to be a popular source of hydrogen. However, it is no longer a pipe dream that in the not-too-distant future, the majority of us will be driving non-polluting cars powered by Hydrogen from a clean, renewable source.

Questions

Questions 1-2

Choose the appropriate letters A – D that best answer the question.

1. Which of the following Hydrogen production methods for Hydrogen-powered cars is viewed in the article as a temporary measure?

A. A system that generates hydrogen from fossil fuels.

B. A technique for generating hydrogen from water vapor.

C. A method of producing hydrogen that involves the use of microscopic organisms.

D. An electrolysis basis Hydrogen production system.

2. Which of the following is NOT a potential problem with the introduction of Hydrogen cars?

A. The frequency of refueling stops.

B. The production of byproducts from the electricity generation process.

C. The volatility of Hydrogen.

D. Keeping Hydrogen in cars.

Questions 3-9

Reading Passage 1 has 8 paragraphs (AH). From the list of headings below choose the most suitable headings for paragraphs B – H. Write the appropriate number (i – xi) in boxes 3 – 9 on your answer sheet. NB There are more headings than paragraphs, so you will not use them all.

Example:

Paragraph A - Answer iv

List of Headings

i. Storage of Hydrogen

ii. Traditional Production Methods

iii. The Potential Peril of Combustible Hydrogen

iv. A Wide Range of Options

v. Looking Ahead

vi. Good idea, but...

vii. Hydrogen Production Today

viii. How Does the Procedure Work?

ix. Hydrogen Production and Sources

x. The Internal Combustion Engine's Operation

xi. The Engine Problem

3. Paragraph B

4. Paragraph C

5. Paragraph D

6. Paragraph E

7. Paragraph F

8. Paragraph G

9. Paragraph H

Questions 10-14

Complete each of the following statements (Questions 9 – 13) with words taken from Reading Passage 1. Write NO MORE THAN THREE WORDS for each answer.

10. There is no reason to believe that we will run out of Hydrogen because it is the _____ that exists.

11. Companies have devoted _____ to the production of Hydrogen cars.

12. Traditional fuels could be used to generate the Hydrogen required to power Hydrogen cars.

13. The Hindenburg disaster was caused by _____, according to investigations.

14. Hydrogen cars have the potential to provide the _____ that we currently associate with fossil fuel-powered vehicles.