

Business Standard

TRENDING ON BS

Search

News ▼

[News-IANS](#) » [Science-Tech](#) » [Science-Tech](#)

Eco-friendly cars running on air? Indian scientists show a way

IANS | Kolkata

May 7, 2015 Last Updated at 14:18 IST



◀ 24 ▶ 2

ALSO READ

GTA introduces eco-friendly cars for tourists in Hills

TERI 'green tour' to promote

Eco Friendly Food Processing Park to hold EGM

'Eco-friendly habits not contradictory to comfortable living'

Eco Friendly Food Processing Park to hold board meeting

Cars that run on air and puff out water vapour as exhaust? Well, Indian scientists claim solar energy can be integrated with unique devices called fuel cells to generate clean energy that could power green

At a time when carbon dioxide emissions from vehicles have come under the scanner for problems related to climate change, fuel cells are being seen as promising alternatives to fossil fuels.

And fuel cell vehicles are a reality now. In fact, in November last year, Toyota unveiled the Mirai, one of the first hydrogen fuel-cell vehicles to be sold commercially. Honda also displayed its sleek, new environmental friendly car engineered on the same principle.

"One of the major drawbacks of fossil fuel is that it generates greenhouse gas such as carbon dioxide. Also, due to incomplete combustion it produces a deadly poison like carbon monoxide," Swadhin Mandal, a scientist at Kolkata's Indian Institute of Science Education and Research, told IANS.

But in a fuel cell, hydrogen combines with oxygen to produce electricity, heat, and water - which makes it eco-friendly.

Due to the storage and safety concerns of hydrogen, the focus now is on hydrogen peroxide as the source.

Mandal and his collaborators at IISER-Kolkata and the Pune-based CSIR-National Chemical Laboratory have gone a step ahead to make the technology more energy-efficient.

According to the expert, by using solar energy tapped via photovoltaic cells, one could drive such fuel cells out of air.

"In principle, you can capture oxygen from air and use a photovoltaic cell to convert oxygen to hydrogen peroxide. So on a sunny day, you could use that to produce electricity and water," said Mandal, an associate professor at the institute's Department of Chemical Sciences.

The researchers have shown a new route that makes a hydrogen peroxide-based fuel cell 140 times more active.

Published online in the Journal of The American Chemical Society (JACS), the study is co-authored by students Anand Pariyar, Gonela Vijaykumar, Mrinal Bhunia, Suman Kumar Dey and Santosh K. Singh.

They have displayed the use of a novel iron-based substance to speed (act as a catalyst) up the energy generation - the key to the fuel cell's high performance.

"This makes the procedure not only energy efficient but also cost-effective since we did not use conventionally used platinum catalyst, which is very expensive. Moreover, hydrogen peroxide storage and transportation is very easy compared to hydrogen," said study co-investigator Sreekumar Kurungot from CSIR-NCL, Pune.

Mandal added: "Eventually, with more technological breakthroughs, hydrogen peroxide fuel cells should be able to power automobiles using oxygen from the air. In addition, the hydrogen peroxide-based fuel cell is now considered the best option for use as a power source at space stations, remote military camps and for underwater power requirements."

(Sahana Ghosh can be contacted at sahana.g@ians.in)


READ MORE ON [ECO-FRIENDLY CARS RUNNING ON AIR? INDIAN SCIENTISTS SHOW A WAY](#)
[NEWS-ANS](#) [SCIENCE-TECH](#)

PREVIOUS STORY

 **Partly cloudy Thursday morning in Delhi**

NEXT STORY

Six electrocuted in Bihar

Malaysia cousin to (Foodie] 

RECOMMENDED FOR YOU



Eco-friendly cars running on air? Indian scientists show the way

[×](#)

The StatesmanGet - On the App Store

[Download](#)

Thursday, 05 May, 2016



Science and Tech

Eco-friendly cars running on air? Indian scientists show the way

IANS Posted at: May 7 2015 3:58PM

Indian scientists have shown a new route to make fuel cells more efficient, thus pushing further the possibility that cars could one day run on air.

In a study, researchers said they had used an iron-based substance to act as a catalyst, instead of platinum, to speed up energy generation in a hydrogen peroxide-based fuel cell.

According to the study co-investigator Sreekumar Kurungot from CSIR-NCL Pune, this makes the hydrogen peroxide cell 140 times more active.

Eco-friendly cars running on air? Indian scientists show the way

"It makes the procedure not only energy efficient but also cost-effective since we did not use conventionally used platinum catalyst, which is very expensive.

Moreover, hydrogen peroxide storage and transportation is very easy compared to hydrogen," said study co-investigator Sreekumar Kurungot from CSIR-NCL, Pune.

A fuel cell combines hydrogen with oxygen to produce electricity, heat, and water - which makes it ecofriendly. But due to the storage and safety concerns of hydrogen, the focus now is on hydrogen peroxide as the source in fuel cells.

"In principle, you can capture oxygen from air and use a photovoltaic cell to convert oxygen to hydrogen peroxide. So on a sunny day, you could use that to produce electricity and water," said Mandal, an associate professor at the institute's Department of Chemical Sciences. The electricity could power the car and water would be an eco-friendly byproduct.

Mandal added: "Eventually, with more technological breakthroughs, hydrogen peroxide fuel cells should be able to power automobiles using oxygen from the air."

In addition, he said, the hydrogen peroxide-based fuel cells are now considered the best option for use as a power source at space stations, remote military camps and for underwater power requirements.

Mandal and his collaborators at IISER-Kolkata and the Pune-based CSIR-National Chemical Laboratory have been instrumental in taking the technology a step ahead.

Published online in the Journal of The American Chemical Society (JACS), the study is co-authored by students Anand Pariyar, Gonela Vijaykumar, Mrinal Bhunia, Suman Kumar Dey and Santosh K. Singh.

At a time when carbon dioxide emissions from vehicles have come under the scanner for problems related to climate change, fuel cells are being seen as promising alternatives to fossil fuels.

Fuel cell vehicles are already a reality. In November last year, Toyota unveiled the Mirai, one of the first hydrogen fuel-cell vehicles to be sold commercially. Honda also displayed its sleek, new environmentally friendly car engineered on the same principle.

"One of the major drawbacks of fossil fuel is that it generates greenhouse gas such as carbon dioxide. Also, due to incomplete combustion it produces a deadly poison like carbon monoxide," Swadhin Mandal, a scientist at Kolkata's Indian Institute of Science Education and Research, said.

-
•
- [Tweet](#)