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Departmental Seminar

Hydrogen: The Ultimate Fuel of the Future

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Abstract

Every aspect of human life in the modern world is associated with the use of energy. According to a recent UN report, the current world population of 7.2 billion is projected to increase by 1 billion over the next 12 years and reach 9.6 billion by 2050. Thus, there is an ever-increasing demand for energy due to population growth and rise in living standard. Presently, the world's energy consumption amounts to about 16 TW, of which more than 80% are supplied by fossil fuels. Hence, the fossil fuel (crude oil) reserves are vanishing at the rate of 4 billion tonnes a year; if this depletion rate continues without any further increase in growing population, the known oil reserves will be exhausted by 2050. In contrast, renewable energies are inexhaustible and are decentralized (can be produced anywhere). Renewable energies such as solar and wind energy provide intermittent supplies of electricity, while options for large-scale electricity storage and transportations are limited. *Hydrogen energy*, on the other hand, would come to play an important role in the future energy demands. Hydrogen is the only energy that can provide both commercial energies, such as electricity and clean fuel for transportation.

In this talk, I will discuss about the importance of hydrogen energy and various components of hydrogen economy and the issues and challenges associated with its technological advancement. I will also discuss some of our recent research works on hydrogen storage materials and its application in developing hydrogen fueled cars.