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Developments in hydrogen production through microbial processes: Pakistan perspective

Abstract

Currently, hydrogen (H2) is primarily used in the chemical industry as a reactant, but it is being proposed as future fuel. H2 has great potential as an environmentally clean energy fuel and as a way to reduce reliance on imported energy sources. A combination of the need to cut carbon dioxide emissions, the prospect of increasingly expensive oil and the estimated growth in the world's vehicle fleet indicates that only H2 can plug the gap. There are many processes for H2 production. The key issue to make H2 an attractive alternative fuel is to optimize its production from renewable raw materials instead of the more common energy intensive processes such as natural gas reforming or electrolysis of water. With such vision, this paper reviews developments in microbial processes for H2 production followed by a road map to H2 economy in Pakistan. The H2 economy potentially offers the possibility to deliver a range of benefits for the country; however, significant challenges exist and these are unlikely to be overcome without serious efforts.