

**AN EXPERIMENTAL CONCEPT OF HYDROGEN PRODUCTION  
CELL FROM SEAWATER GALVANIC- CELL**

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# CHAPTER 1

## 1.1 INTRODUCTION

To date, energy generation and dependence throughout the world has largely been based on fossil or hydrocarbon based fuels. With the ongoing depletion of oil a prime constituents of fossil fuels, in addition to anthropogenic greenhouse gas emissions (contributing to the global warming) and other pollutants, had rapidly increased the initiative to substitute fossil fuels with other type of fuel sources. An important aspect that needed to be considered included the aspect of sustainability, costs, fuel resource availability and also environmental acceptability.

Although many alternative sustainable energy pathways may emerge, the so-called “Hydrogen economy” has received particular attention (Bockris; J.O’M, 2002). A Hydrogen-based energy system is regarded as a viable and advantageous option for delivering high-quality energy services in a wide range of applications in an efficient, clean and safe manner while meeting sustainability goals (Conte; M. *et al.*, 2001). Hydrogen also provides an ideal complement to electricity.

It is also acknowledged that, the future Hydrogen economy scenario would be dependent much on water electrolysis processes to obtain sustainable supply of Hydrogen to cater for its fuel demand. For that matter, two important issue regarding Hydrogen production are the capital energy investment required as an input for the electrolysis and the use of a huge amount of water (preferably clean water) to be electrolyzed

to produce sufficient volume of Hydrogen. A simple and intermediate approach implying to present scenario would be by using electricity from power generation plant.

However, since the seawater electrolysis concept is relatively new and much of the effort is currently under various research and development phases, therefore there is not much information at present regarding this concept, but, as far as the future Hydrogen economy is concerned, seawater electrolysis may indeed replace the concept of water electrolysis and seawater may eventually becomes the dominant source for producing Hydrogen electrochemically, with the fact that about 70% of the world is covered by seawater but only little had been done to really exploit the benefits that seawater may present for the human race.

## **1.2 Hydrogen Production via Electrochemical Processes**

Such as being said earlier, in order to produce Hydrogen from the water electrolysis process, first the energy consideration sources required as an input to the electrolysis unit. Although electricity from current power plant may be available for this purpose but still it would not be practical as far as the future sustainable Hydrogen supply is concern, and this merely due to the fact that, current electricity-generating plant depends much on fossil-fuels as its fuel inputs, and eventually this fuels will certainly runs out one way or another.