



Green Hydrogen for Clean Environment

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Received: 📅 June 15, 2023

Published: 📅 June 28, 2023

Opinion

The water electrolysis process is an environmentally friendly method of producing hydrogen since it uses water (an abundant resource) and creates no pollutants. What's more, the hydrogen produced can be used as a clean energy source to power hydrogen-powered vehicles, electric generators, and other industrial applications. Electrolysis is a process that produces chemicals by separating a solution using an electric current. Electrical energy is applied to the electrodes of an electrolyzed device, which is a device used for this purpose, and the electrochemical reactions that take place separate the molecules into ions.

Photovoltaic panels and electrolysers have been around for a long time and are the focus of much attention today. So, there's no question of reinventing them. What we need to do is take advantage of the ongoing improvements in performance (yield, stability, durability, recyclability, etc.) of these technologies, develop them on a larger scale and reduce their cost, notably through the development of catalysts based on non-noble metals. With a photovoltaic system offering an efficiency of 25% and an electrolyzing operating at 80% (which is conceivable), an overall efficiency of 20% can be expected, well above that of natural photosynthesis. Calculations show that with just 55-meter square of panels, electrolyzing just 2.5 liters of water per day, which produces 0.5 kg of hydrogen per day, the electricity needs of this house are met.

The non-conventional water, especially mine waters in abandoned mine area and still mining areas are a threat for the environment. The idea aims to reduce the environmental impact of these waters which are a challenge of the water and environmental authorities in several areas worldwide. The abandoned mine areas were in some cases rehabilitated as a testimony of ancient mining processing and for education or touristic purposes as well. However, the mine, by the natural process of mineral alteration in presence

of moisture, oxygen and a mixture of heavy metals and trace elements, is usually source of the acid mine drainage phenomenon, majority of ancient mine show this acid mine drainage that threaten, continuously, water resources around the mine area and it's neighboring. In the other hand, several regions of the world where ancient mine processing were localized in Mediterranean areas. During colonialism, several occupied countries were subject of geological exploration to identify possible exploitable resources. After the colonialism period, some mine areas were still productive decades independence.

The heritage of these exploitations began to appear after the mining process ended and the abandoned galleries, the holes and the pet were filled with water. Minerals as pyrite are largely present in the rich land is source of the pH decrease by its oxidation to sulfuric acid, and so is responsible of the mobilization of several trace elements and heavy metals that at high concentration could be toxic to the biota. The mine water as a non-conventional water is a great source of water and is conducts electric potential with more efficiently than other water types. This high charge of toxic metals may be extracted from the mine water by exploiting them to produce green hydrogen and to protect the environment.

Ongoing experimentations at a very small scale show some interesting results, the water mine, with their countenance on heavy metals allow high electrical conductivity between the anode and the cathode and both hydrogen and oxygen production are greater see water or more rich potassium water that steel very productive also. Moreover, after seconds of this manipulation, a thin film of deposited metals covered the anode and the cathode. This metal accumulation was removed with sandpaper and could a way of their valorization. In my opinion, several areas around the world have the heritage of past mining and their impact on the environment, green hydrogen

production is an issue to produce clean energy and rehabilitate the environment. This could be an alternative to protect water resources from any kind of pollution and contamination. In fact, human activity is still increasing and exclusively based on transformation of earth resources for human needs. In addition of abandoned mine water, or naturally rich alkaline waters, mine in process, or all other non-conventional water sources, or waste waters could be useful to produce clean energy and, inject to the hydrological cycle, clean and useful moisture in areas where water is scarce.

Thus, Electrolysis breaks down water molecules into oxygen and hydrogen. The technique is used to produce hydrogen from unconventional waters. The speed of electrolysis is affected by

several factors, such as ion concentration, temperature, and applied voltage. As a rule, higher voltage means faster electrolysis.

Studies on the electrolysis rate of unconventional waters have shown variable results depending on water type and experimental conditions. Wastewater showed slower electrolysis rates than rainwater or freshwater. Similarly, studies have shown that the electrolysis rate of saline waters can be accelerated by using specialized electrodes. Other purposes of electrolysis from mine water, Metal recovery Silver, Cadmium, Cobalt, Copper, Tin, Nickel, Gold, Palladium, Lead, Rhodium, Zinc... and Oxidation of certain organic compounds: cyanides, avoid de cyanidation decanoate without adding chemicals.