

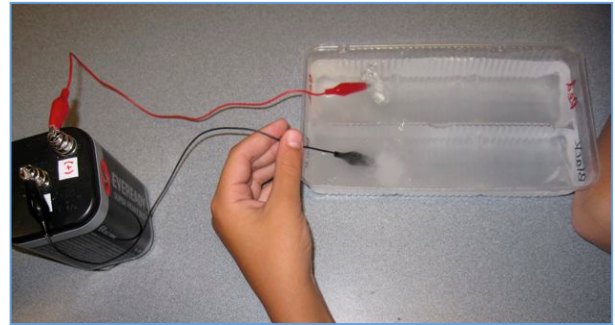


Energetic Electrolysis:

The Potentials of Hydrogen Power

Background Info

Electrolysis is the process of using an electrical current to separate water into hydrogen and oxygen gas. The electrical charge that is applied to water will break the chemical bond between the hydrogen and oxygen atoms and produce charged particles called ions. For the purposes of this experiment, the charged hydrogen and oxygen gas is produced at aluminum foil electrodes. Once captured and stored, hydrogen gas can be run through a fuel cell to power cars, homes, even computers.



Hydrogen gas produced through electrolysis can be used for power when run through a **fuel cell**. A fuel cell combines separated hydrogen and oxygen to make electricity. In the past several years we have seen great advances in fuel cell technology and an accompanying increase in excitement around the potentials for hydrogen power to replace fossil fuel energy sources.

There are several obstacles to overcome if we are to use hydrogen as an energy source. Hydrogen gas is very flammable, and there are safety issues surrounding its storage and transport. The explosive property of hydrogen is demonstrated in this activity and serves as a good launching point for discussing storage issues. Currently scientists are working on developing safe transport and storage systems for hydrogen gas.

The production of hydrogen gas is not always “clean and green.” In fact most hydrogen gas produced in the United States today is made using non-renewable resources such as electricity produced from coal fired power plants that produce the electricity necessary for electrolysis.

Hydrogen does have the potential to be a clean energy carrier if the electrical current necessary for electrolysis is produced from a renewable energy source such as solar or wind power. Images of off-shore hydrogen power plants powered by solar panels have increased the excitement around hydrogen power. In addition to having plentiful sunlight, the salty ocean water helps to conduct electricity that allows for electrolysis to occur. The hydrogen gas produced from the electrolysis can then be stored and transported to power devices such as cars, homes, and computers. Using hydrogen power and fuel cells to store renewable energy can reduce our use of pollution producing energy sources such as fossil fuels, therefore reducing pollution and helping to slow the rate of climate change.

Credits

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