Harnessing hydrogen energy

Hydrogen is a clean energy source that can be used to store and transport energy. By splitting water into hydrogen and oxygen, we can use hydrogen as a fuel to power vehicles or to generate electricity. Researchers are working on developing catalysts that can efficiently split water into hydrogen and oxygen. These catalysts are made from a combination of metals that can push chemical reactions. Using these catalysts, researchers can split water into hydrogen and oxygen more efficiently and at lower cost.

Splitting water into hydrogen fuel

In searching for the best solar cells, researchers are exploring ways to improve the efficiency and durability of solar panels. Scientists are using graphene to create a better charge collector. They are also using perovskite crystals because they can be tuned to make them useful sunlight-absorbing films. These findings help optimize photoelectrochemical characteristics of high output solar devices.

Cutting through the dark with perovskite crystals

Researchers are working to develop solar cells that can harvest the full spectrum of light. They are exploring materials that can convert sunlight to electricity more efficiently and at lower cost. These materials have shown great promise as materials for harvesting solar energy, and perovskite solar cells are a promising candidate. Researchers are working to develop a new way to build these state-of-the-art solar cells, eliminating several wasteful steps in their development.

Stronger, better solar cells

As the need for clean energy increases, researchers are exploring ways to improve the efficiency and durability of solar cells. They are using materials that can push chemical reactions to harvest hydrogen from biological sources. This is made possible through the use of catalysts, materials that push chemical reactions. Researchers from the Indian Institute of Technology Delhi and the University of Western Ontario are investigating these chemical reaction systems in order to develop better, more efficient production methods.

Capturing solar energy with perovskite crystals

Perovskite crystals have shown great promise as materials for harvesting solar energy, and perovskite solar cells have rapidly reached power conversion efficiencies as high as 21 per cent. Unfortunately, a major barrier to their commercialization is that promising perovskites decompose quickly under humid conditions. Researchers have discovered that adding specific materials to the perovskite can stabilize it. This allows them to develop new solar cells that can harvest this form of energy. Researchers from the University of Saskatchewan, Indian Institute of Technology Delhi, and King Abdullah University of Science and Technology in Saudi Arabia, are working to harvest this form of energy. Quantum dots and perovskite crystals can also be used to harvest some solar energy with properties that can be tuned to make these useful sunlight-absorbing films.

ALTERNATIVE ENERGY DEVELOPMENTS

Environmentally-friendly thermoelectrics

Thermoelectric materials can be used as alternative sources for power generation and refrigeration. A thermoelectric material creates voltage when a temperature difference is applied to it, and it can also convert heat into electricity. Thermoelectric devices are reliable energy converters and produce no noise or vibration as there are no mechanical moving parts. Researchers from Canada, United States, and Japan are using the CLS to characterize the density, thermoelectric, and electrical transport properties of magnesium silicon-antimony, aluminium, and zinc impurities.

Stronger, better solar cells

About half of Canada’s renewable electricity comes from hydroelectric power plants located at the mouth of perennial rivers. This year marks the 100th anniversary of the development of the first photovoltaic solar cell. This development led researchers to explore ways to make better solar cells.

Developing new solar materials

Solar energy is abundant, and has long been of interest as an alternative energy source. Researchers in solar devices are largely focused on identifying and improving materials that can convert sunlight to usable energy more efficiently and at low cost. Researchers at the University of Saskatchewan, Indian Institute of Technology Delhi, and King Abdullah University of Science and Technology in Saudi Arabia, are working to harvest this form of energy. They are exploring new materials that can push chemical reactions to harvest this form of energy.

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