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We next review a broad range of semiconductor photoelectrodes broken down by material class (oxides, nitrides, chalcogenides, and mature photovoltaic semiconductors), identifying intrinsic properties and ...

Yet behind these shining panels lies a hidden network of chemical processes that make advanced solar energy possible. From purifying silicon and etching wafers to managing temperatures ...

This Review compares the state of the art of photovoltaic materials and technologies, detailing efficiency limitations and the innovations needed to overcome them.

In recent years, photovoltaic cell technology has grown extraordinarily as a sustainable source of energy, as a consequence of the increasing concern over the impact of fossil fuel-based energy on ...

We scrutinize the unique characteristics, advantages, and limitations of each material class, emphasizing their contributions to efficiency, stability, and commercial viability. Silicon-based cells ...

Materials chemistry is the key to unlocking these benefits, and chemists have taken up the challenge of creating new classes of materials that effectively convert solar energy into electricity ...

We hope that this themed issue on emerging materials for solar energy harvesting in the Journal of Materials Chemistry A will not only provide readers with new insights, but also stimulate new ideas.

The construction of solar cells involves a variety of materials, each playing a crucial role in the conversion of sunlight into electrical energy. Understanding these materials and their properties ...

This overview explores commonly used materials for solar and wind power, exploring their limitations and continuing research trends for more sustainable and improved materials for these two ...

As solar photovoltaic will play a very crucial role in the future, it is essential to analyze and have comprehensive study based on materials and types of technologies.

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