

Design scheme for the application of rare earth in solar container

<div class="df_qntext">How can rare earth ions improve nanostructures?

Downsizing the materials into nanostructures and incorporating rare earth (RE) ions are effective means to improve their properties and broaden their applications.

<div class="df_qntext">What are rare earth elements (REE)?

Rare earth elements (REE) contain Sc and Y plus the lanthanide series elements (La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, and Lu). Various synthesis methods are used to prepare RE-doped oxide nanophosphors such as solution combustion, sol-gel, hydrothermal, coprecipitation, and solid-state methods.

<div class="df_qntext">Are rare earth metals a dopant?

Rare earth metals as a dopant give many promising effects to zinc oxide as the main material. This review provides a succinct overview of the synthesis methods, characteristics, and applications of ZnO doped with rare earth metals (ZnO/RE).

<div class="df_qntext">How many patents does China have on rare earth elements?

Patent activity is another aspect of China's dominant power over global production of REEs. As of October 2019, China had applied for 25 911 patents on all the rare earth elements since 1950, compared with 13 920 for Japan, 9 810 for the United States and 7 280 for the European Union (Ng, 2019).

<div class="df_qntext">How are ion-exchangeable rare earths extracted?

When ion-exchangeable rare earths are brought into contact with chemically active cations (e.g. Na^+ , NH_4^+ , Mg^{2+} , Ca^{2+} , Al^{3+} , etc.), the REEs can be exchanged and desorbed. A series of leaching agents, such as ammonium sulphate, magnesium sulphate and aluminium sulphate, have been developed for extracting REEs in-situ.

<div class="df_qntext">Can rare earth metals be used to make ZnO nanomaterials?

Fabricating ZnO nanomaterials with tailored characteristics has become a prevalent and current focus. Within this framework, the integration of rare earth metals sparks interest due to their distinctive 4f electronic configuration, providing an exceptional opportunity to manipulate ZnO's optical, luminescent, and surface properties.

By applying rare-earth complexes as photovoltaic precursors, the conversion efficiency of solar cells were improved. Rare-earth complexes absorb light at shorter wavelengths and ...

The electronic structure of rare earth elements, the analysis of spectral characteristics and chemical properties were outlined. The application of rare earth elements in ceramic oxides, non ...

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The rare earth material improvement of solar cell is discussed. Organic-inorganic lead halide based perovskite solar cell has received broad interest due to their merits of low cost, a low ...

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Graphical abstract Schematic illustration of rare earth-based synthesis and functionalization of biodegradable polymers. (1) Catalytic roles of rare earths in the synthesis of major ...

Organic-inorganic lead halide based perovskite solar cells have received broad interest due to their merits of low fabrication cost, a low temperature solution process, and high energy conversion ...

Rare earth elements played an indispensable role in these processes. In addition, modifying with rare earth elements can be a promising approach to enhance the photo-catalytic performance of MOFs, ...

In this paper, we review the principles and application status of existing processes from two perspectives, namely, the extraction of transmitted rare earths and the preparation of rare earth ...

The rare-earth elements have been recently employed to effectively overcome these drawbacks according to their unique photophysical properties. Herein, the recent progress of the ...

Abstract By applying rare-earth complexes as photovoltaic precursors, the conversion efficiency of solar cells were improved. Rare-earth complexes absorb light at shorter wavelengths and subsequently ...

Solar cells are crucial in clean energy but still face challenges in efficiency and stability. This review explores the application of rare earth doped down-conversion materials in improving the ...

This paper presents an update on all aspects of REE including their distribution in the Earth's crust, impact on environment, and human health. Other aspects covered include different ...

The rare-earth elements have been recently employed to effectively overcome these drawbacks according to their unique photophysical properties. Herein, the recent progress of the application of ...

This review focuses on the development history of perovskite nanocrystals, including rare earth-doped lead-based perovskite nanocrystals and rare earth-based lead-free perovskite ...

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This review examines recent progress in using rare earth-based photocatalysts and their composites to degrade environmental pollutants. Rare earth elements (REEs), recognized for ...

To promote the competitiveness of the rare earth functional materials in China, some policy suggestions are proposed, including strengthening strategic prediction and policy support, promoting basic ...

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