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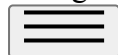


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Progress on perovskite materials for energy application

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Highlights

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Structural properties of perovskite materials are reviewed.

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Synthetic methods for preparation of perovskite materials are overviewed.

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The effect and role of defects in perovskite as energy materials are highlighted.

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Opportunities future perspective and challenges in perovskite materials discoursed.

Abstract

Energy underlies the human development and welfare. Today energy depends on combustion of fossil fuels (coal, natural gas, oil) sources. These sources have not only led to severe environmental issues because it emits greenhouse gases, they are rapidly depleted due to their enormous consumption. For several years' numerous technologies have been developed to address the fossil fuel depletion and greenhouse gases emission from the non-renewable in order to constantly supply energy to the people and industries. However, the challenge of being able to store energy generated and utilize it later is a matter of importance when resolving energy problems persists. New materials, particularly perovskites offer a great advantage to be utilized as a possible host or carriers for energy applications. The impact of defect on the material properties and influence of defects as material for energy application is described. The use of perovskites oxides for effective electrocatalysis in hydrogen evolution reactions, photocataysis, photovoltaic solar cells, electrocatalysis, solid oxide fuel cells, supercapacitors and metal-air batteries, are also included. This review covers the latest progress on perovskite oxides as electrochemical energy materials.

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