



Perspective

Nano porous systems for storing hydrogen-based clean fuel

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Rapid growth in population, Concerns about the industrial revolution, environmental and energy issues are growing, and are urging the use of clean, renewable energy sources to ameliorate the dire situation. Hydrogen is an ideal synthetic fuel because it is light, very broad, and is an oxidation product (water), i.e. environmentally friendly, but storage problems remain [1-3]. Hydrogen storage has become more feasible these days due to the development of fast upgraded systems such as a homogeneous catalytic system that selectively decomposes materials into H₂ and CO₂ [4-6]. These conditions has led to the continuous generation of H₂ with very high purity over various range of pressures under mild conditions. Hydrogen referred to as energy currency is considered to be a promising alternative to fossil fuels with its high gravimetric energy density, availability of renewable energy sources, and environmental benefits. As an important application of hydrogen energy, hydrogen fuel cells can convert chemical energy into electrical energy with high efficiency, which is a potential power candidate for aircrafts, vehicles and other portable devices [7,8]. However, it requires high-quality hydrogen and stable hydrogen supply pressure [3,9]. It is therefore important to examine a wide range of Nano-based systems which can be subsequently used for improving kinetics due to storage of nanoscale solids, properties of nanocomposites with its designing, and improvements in working hydrogen storage systems for running vehicles.

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