
Materials for Energy Storage: An Emerging Scenario

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Increasing global demand for energy, coupled with cleaner environmental requirement, is one of the biggest challenge being faced today. Materials for energy storage, be it conventional or renewable, are subjected to intense research and development. In this talk, I shall start with an overview of the essential requirements for storage of renewable energies, from the point of view of a materials scientist. I shall then focus on some nanostructures, in particular carbon based nanostructures, that can be used for efficient storage of hydrogen and also as metal-free catalysts for low temperature fuel cells. First principles density functional based simulation prove extremely handy in designing such novel materials with desired combination of properties After presenting some case studies, I shall wrap up by arguing how materials scientists, who sometime might sound futuristic, can play a crucial role in building up a sustainable energy economy.