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Review of recent developments in batteries for Electric Vehicles

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In Electric Vehicle (EV) drive train traction batteries are considered as a key enabling technology. For many years to come lithium ion based batteries are expected to be the technology of choice among all available traction batteries. Other battery technologies including non-lithium ion based chemistries are likely to get more popular in the long range perspective may be in decades. However for the global automotive market to be completely powered by traction batteries it is a long way to go. An alternative electrochemical device also needs to be developed in addition to low cost high energy battery technologies for a complete deployment of these technologies to a complete global level. Hydrogen fuel cells, Proton Exchange Fuel Cells (PEMFU), solid state lithium ion batteries and various battery technologies that are likely to be successful in commercial application in the EV market have been discussed. Safety, power grid compatibility, low cost, specific energy and long range transportation utility of these batteries must be improved fully for wider acceptance of these batteries for the global EV market. Various latest developments in nickel metal hydride batteries, lithium sulfur batteries, lithium air and lithium zinc batteries are also presented. For the long range low cost EV market lithium sulfur batteries are most likely to completely replace lithium ion batteries in future. For container trucks and passenger vans fast refueling and grid compatible fuel cells are mostly suitable. Future focus areas of research of the battery developments for the EV market are also presented. For achieving a good transition to clean and low carbon transportation we may have to choose diverse battery technologies and fuel cells for powering electric vehicles.

Biography

P Siva Prasad has awarded with PhD degree in Chemistry from IITM, India in 1979. He has 39 years global chemical industrial research experience and has worked in wide range of chemical process industries. He has specialized in electrochemical technologies, chemical formulations, polymer recycling, polymer coatings and geopolymer concrete. Currently he is focusing on development and recycling of batteries for electric vehicles. He is currently working at Chennai, India as a Senior Chemical Consultant.

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