Energy Quarterly

News and analysis on materials solutions to energy challenges

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MRS Bulletin

Materials for energy: Energy, economy, and the environment

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Last year we welcomed interested scientists, engineers, students, and the general public to the Materials Research Society's (MRS) "Materials for Energy" blog. As the world advances into the 21st century, issues of energy, the economy, and the environment move to the center of our concern for the future. Materials science plays a key role in addressing these issues and providing both current and potential solutions. These are the issues that are addressed in our blog.

We all recognize the importance of energy in the coming years for global economic growth and security. We also recognize that energy production in any form has environmental consequences that must be considered. Materials research is key to the development and maintenance of reliable and safe energy sources, which are affordable and environmentally acceptable. For example, electric vehicles are considered by many as the future "environmentally friendly" mode of personal transportation in the developed and developing countries. However, the electric motors used require rare earth metals such as neodymium, whose mining presents environmental issues. Additionally, the ability to store energy with the batteries currently available is still limited (~100 miles range), and a sobering fact is that per liter, diesel or jet fuel has the highest energy content per unit volume or weight of any practical energy storage medium (~350 miles range or better depending on car model), except for nuclear energy fuel pellets. And then there is the question about where the electricity with which we charge these cars will come from. If it is from a coal-fired power station, then what about the CO_2 produced? Materials research should be able to provide answers.

It is the purpose of the "Materials for Energy" blog to discuss the scientific issues surrounding all areas of materials for energy: basic research, scale-up and commercialization, deployment, environmental impact and send your ideas, including raw materials acquisition, as well as recycling and disposal technologies. To effectively discuss these issues, we have invited a series of experts as co-hosts to assist in guiding the discussions and to present current articles and resources for discussion.

We invite all to participate. Please join the fun and send your ideas!

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