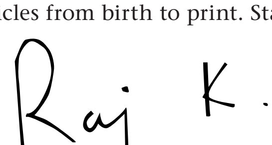
From the Editor

Plug and Play

Batteries have been in the media headlines in recent months. The Columbia dry-cell battery, pioneered by National Carbon Co. (the predecessor of today's Energizer Co.), was designated an American Chemical Society National Historic Chemical Landmark on September 27 in Cleveland, Ohio. Lithium ion batteries are enjoying a huge surge of R&D interest and considerable effort is under way to enhance their power output several fold. Their light weight would make them ideal for use in hybrid electric vehicles (HEVs) if indeed their performance could be boosted. This is especially significant given the environmental and other concerns with the nickel metal hydride batteries currently in use in HEVs. First-generation HEVs used lead acid batteries—obviously a non-optimal choice from several perspectives, not the least of which is mass. Notwithstanding the extreme popularity of HEVs (It does help in our impressionable and trend-conscious society that several celebrities have openly endorsed these 'green' transportation alternatives!), a number of emergency and fire crews have announced that they will refuse to rescue victims trapped in such vehicles, for fear of electrocution or acid burns. Talking of trends, it was not long ago that everyone was going in for gas-guzzling sport-utility vehicles, including some rather ungainly monster machines that one would normally see only in a military situation! Now they are talking about hybrid SUVs and pickup trucks. Everything is cyclical, as they say.

The battery warranties in present-generation HEVs run for eight years or 100,000 miles. Do the batteries actually last that long? What happens after they are "dead?" Do we have a good disposal/recycling model, in an environmental sense? One can argue that the industry has done an excellent job with the disposal/recycling of the lead in lead-acid batteries; but we may be talking here of a scale of use much larger than the starter batteries if the popularity of HEVs continues to rise exponentially. What about battery replacement costs in HEVs? These questions should keep the auto engineering and battery communities busy for a while. The next big thing in HEVs may be plug-in hybrids. Why the excitement in PHEVs? Forcing the vehicle to run only on the electric motor on a routine basis translates to potential savings (estimated to be about 75%) in gasoline costs. When parked, the vehicle can be plugged into a charger (admittedly powered by fossil fuel-derived electricity!), so that the expanded battery pack is fully charged for the next journey. The result is an EV without the usual range limitation. If the travel takes you beyond the range accommodated by the battery pack or if you are otherwise stuck, you simply let the gasoline engine propel you there by flipping a switch. All this sounds almost too good to be true; although as with any brand new technology, it may be prudent to wait a while before heading to the dealership.

Given the above comments, this issue features, appropriately enough, the Battery Division. While the technical challenges with HEVs and PHEVs are not specifically addressed in the pages that follow, three interesting feature articles appear that focus on modeling of battery systems, organic radical batteries, and Li-ion batteries. Many thanks to Walt van Schalkwijk and his Battery Division colleagues for arranging these contributions; and in particular, kudos to Dan Scherson, chair of the Battery Division, for shepherding these articles from birth to print. Stay tuned.



Krishnan Rajeshwar
Editor

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INTERFACE

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