

RESEARCH DIRECTIONS

New age batteries

Dr Adriyan Milev of the School of Science and Health and a team of researchers will be investigating the use of nanocomposite materials to develop high-power lithium battery cathodes. This three-year collaborative project is being supported by the Department of Industry, Innovation, Science, Research and Tertiary Education under the Australia-India Strategic Research Fund. The Australian research team will include Associate Professor Kamali Kannangara of UWS and Dr Antony Hollenkamp of CSIRO. The Indian research team will include Professor Parasuraman Selvam and Dr Raghuram Chetty of the Indian Institute of Technology, Madras.

'Lithium-ion batteries are one of the most popular types of rechargeable battery for portable electronics and are now able to be used higher-volume applications such as plug-in and hybrid electric vehicles', says Dr Milev. 'Batteries used in current hybrid vehicles have proven reliability but are not suitable for electric vehicles or new generation plug-in hybrid cars for which we need to extend the distance they can travel on their electric-power. The biggest hurdle is the time it takes to recharge batteries. We will be looking at new materials for a battery which recharges in minutes, rather than hours and which would have the potential to set hybrids up to compete with petrol-only powered vehicles.'

This project will combine the methodologies developed by the Australian researchers for synthesis of suitable nanomaterials using a new bottom-up approach and the Indian team's conductive nanocarbons to produce electrode materials with enhanced electron and lithium diffusion rates. The researchers will investigate whether these combined technologies will lead to the development of a specially designed



electrode which will speed up the charge/discharge rates of batteries, store more energy and last longer than existing technologies.

This research program is expected to contribute to new generation advanced energy storage devices which will power electrical vehicles with sufficient driving range to gain widespread acceptance by the public. The broader benefits of such technology include transforming the environmental impacts of road travel, boosting energy security, creating a new set of industries with associated job opportunities and direct health benefits from improved urban air quality.

Project Title: Nanocomposite Material for High-power Lithium Battery Cathodes

Funding has been set at: \$280,000

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October 2012