TIP Project Brief – 090163/10H008

Manufacturing
High Volume Production of Nanocomposite Electrode Materials for Lithium-Ion Batteries

Develop a new composite nanomaterial for lithium-ion battery cathodes for significantly increased battery performance together with improved manufacturing techniques to lower overall costs.

Sponsor: A123Systems, Inc.
Ann Arbor, MI

- Project Performance Period: 2/1/2010 - 1/31/2013
- Total project (est.): $6,000 K
- Requested TIP funds: $2,864 K

A123Systems, Inc. is developing a new nanocomposite material for lithium ion battery electrodes together with improved manufacturing process technologies to enable both significantly improved battery performance and lower manufacturing costs. With their high energy-to-weight ratios, lithium ion batteries are an important enabling technology for electric vehicles, upgrading the electric utility grid, and increasing the use of variable renewable energy sources such as wind and solar power. The highest barrier to adoption of lithium ion batteries in the transportation market is cost, and the largest cost component of the battery is the positive (cathode) electrode material. Technology innovations that either improve the efficiency or lower manufacturing costs of cathode materials, therefore, can have a major impact on the lithium ion battery market. A123Systems has an existing iron-phosphate nanocomposite electrode material that has enjoyed commercial success and is commonly used in batteries for cordless power tools, among other applications. The current project pursues a novel second generation nanomaterial that would replace some or all of the iron with manganese, increasing the battery's energy density and therefore reducing cost per watt-hour. This project also will develop a number of improvements to the manufacturing process used to make the nanoparticles which should result in a threefold increase in manufacturing throughput. Since capital equipment and facilities are primary factors in the cost of electrode materials, increasing throughput offers the best leverage for cost reduction. The ultimate goal of the project is to scale up from 10 grams per lab batch to more than 10 kilograms per day production in a quasi-continuous pilot demonstration.

For project information:
Dr. Mike Wixom, (734) 213-1623
mwixom@a123systems.com