the polymer electrolytes with carbon substrates, flow-cell stacks with membrane electrode assemblies (MEAs) may be configured much like with fuel cells with suitable flow-fields in biplates for an all-liquid rechargeable flow-battery.

There are several unique attributes of this flow cell, which is amongst the highest voltage flow batteries, with cell voltages higher than the prior non-aqueous 1.7 V vanadium acetylacetonate redox flow battery. (1) The reaction involves the shuttling of lithium ions from the anolyte to catholyte, much like with traditional Li-ion cells; (2) The reactions involved at both electrodes are mostly chemical, with the oxidized or reduced lithium reacting with the liquid active materials; (3) Both the anolyte and catholyte are electronically conducting with some lithium, thus negating the need for ionic conduction through a lithium salt solution; and (4) The electrodes are only for current collection purposes, which precludes any morphological or interfacial changes at the electrode. All these features will, in principle, contribute to a long cycle life, calendar life, safety, and low self-discharge rates.

This work was done by Ratnakumar V. Bugga, William C. West, Andrew Kindler, and Marshall C. Smart of Caltech for NASA’s Jet Propulsion Laboratory. Further information is contained in a TSP (see page 1).

In accordance with Public Law 96-517, the contractor has elected to retain title to this invention. Inquiries concerning rights for its commercial use should be addressed to:

Innovative Technology Assets Management
JPL
Mail Stop 321-123
4800 Oak Grove Drive
Pasadena, CA 91109-8099
E-mail: iaoffice@jpl.nasa.gov

Refer to NPO-48555, volume and number of this NASA Tech Briefs issue, and the page number.

Using a Blender to Assess the Microbial Density of Encapsulated Organisms

This technology has applications in medical device manufacturing to ensure device sterility.

NASA’s Jet Propulsion Laboratory, Pasadena, California

There are specific NASA requirements for source-specific encapsulated microbial density for encapsulated organisms in non-metallic materials. Projects such as the Mars Science Laboratory (MSL) that use large volumes of non-metallic materials of planetary protection concern pose a challenge to their bioburden budget. An optimized and adapted destructive hardware technology employing a commercial blender was developed to assess the embedded bioburden of thermal paint for the MSL project.

The main objective of this optimization was to blend the painted foil pieces...