



Dr. Seungmin Hyun

Korea Institute of Machinery and Materials, KOREA

Title:

Fabrication of Flexible Li ion Battery

Abstract:

Advance of flexible electronics technology led to convenience of human life due to many applications including sensor, mobile device, and health care. As a proper power source for flexible electronics, the development of flexible battery with high capacity and reliability is critical. In this study, we propose a novel geometric structure for stretchable battery, created by folding well-defined two-dimensional patterns with cutouts to produce an extremely stretchable structure with superior reliability and bi-axial deformability. The performance of the battery is maintained under dynamic deformation with a stretching ratio of 90% and a 10-mm-radius bending curvature, guaranteeing a long-lasting cycle life. Finally, the geometrically designed structure-based battery is applied to movable robots, crawling and slithering, with dynamic bi-axial deformations and can be pivotal role in the development of flexible electronics including human-friendly wearable electronics and soft robots.

Biography:

Seungmin Hyun was born in Seoul, Korea, 1969. He received his B.S. and M.S. degrees from Korea University in 1992 and 1995, respectively. In 2002, he received his PhD degree in Materials Science and Engineering from Lehigh University, PA, U.S. He served as a post-doctoral research associate in the Department of Materials Science and Engineering at Lehigh University from September 2002 to April 2006. He is a Principal Researcher at Korea Institute of Machinery and Materials in Korea since May 2006.

His current research interests are fabrication and characterization of nano scaled structures for energy storage devices. For last 26 years, he has attended many international conferences and published extensively in scientific journals including Nature Communications, Advanced Materials, Advanced Energy Materials etc.