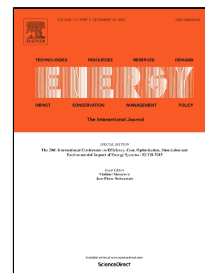


Accepted Manuscript

Destruction mechanism of the internal structure in Lithium-ion batteries used in aviation industry

Paweł J. Swornowski



PII: S0360-5442(17)30128-7
DOI: 10.1016/j.energy.2017.01.121
Reference: EGY 10256
To appear in: *Energy*
Received Date: 27 June 2016
Revised Date: 17 January 2017
Accepted Date: 22 January 2017

Please cite this article as: Paweł J. Swornowski, Destruction mechanism of the internal structure in Lithium-ion batteries used in aviation industry, *Energy* (2017), doi: 10.1016/j.energy.2017.01.121

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

**Destruction mechanism of the internal structure in Lithium-ion batteries
used in aviation industry**

Paweł J. Swornowski

Paweł J. Swornowski, PhD

(1994-2014) Poznań University of Technology

Home address:

Os. Jagiellońskie 21/40

Poznan, Poland

Tel. mobile: +48 723 132 526

e-mail: swornowski@wp.pl

Highlights

- The causes of internal destruction of Lithium-ion batteries are external vibrations.
- The influence of vibrations on the change of a Lithium-ion battery's most parameters.
- The mechanism leading to the explosion of a Lithium-ion battery was demonstrated.
- The conclusions ensuring safe exploitation of a Lithium-ion battery were presented.

Abstract

In the article, the reasons for destruction of the internal structure in Lithium-ion batteries used in aviation industry have been explained. They manifest themselves in the battery's overheating, and in extreme cases they result in explosion. The report presents the results of experiments, which consisted in subjecting the tested Lithium-ion battery to vibration over a specified period of time and observing the changes of temperature inside it with the use of a thermal infrared camera. Another focal point of the study was the influence of vibrations on voltage change in relation to variable current load, and the influence of ambient temperature change on the Lithium-ion battery's voltage change. It has also been demonstrated that vibrations can damage the control electronics of the Lithium-ion battery. Moreover, the mechanism by which potentially dangerous thermal hot spots are formed in a Lithium-ion battery has been presented, as well as an uncertainty analysis of all measurement results.

Download English Version:

<https://daneshyari.com/en/article/5476293>

Download Persian Version:

<https://daneshyari.com/article/5476293>

[Daneshyari.com](https://daneshyari.com)