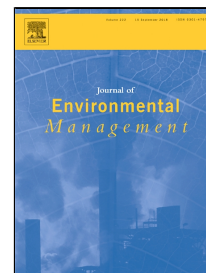


Accepted Manuscript

Comparison of the state of Lithium-Sulphur and Lithium-ion batteries applied to electromobility

G. Benveniste, H. Rallo, L. Canals Casals, A. Merino, B. Amante



PII: S0301-4797(18)30877-6

DOI: 10.1016/j.jenvman.2018.08.008

Reference: YJEMA 7829

To appear in: *Journal of Environmental Management*

Received Date: 27 October 2017

Accepted Date: 02 August 2018

Please cite this article as: G. Benveniste, H. Rallo, L. Canals Casals, A. Merino, B. Amante, Comparison of the state of Lithium-Sulphur and Lithium-ion batteries applied to electromobility, *Journal of Environmental Management* (2018), doi: 10.1016/j.jenvman.2018.08.008

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.

Comparison of the state of Lithium-Sulphur and Lithium-ion batteries applied to electromobility

G. Benveniste ⁽¹⁾, H. Rallo ^(2,3), L. Canals Casals ⁽¹⁾, A. Merino ⁽²⁾, B. Amante ⁽³⁾

⁽¹⁾Institut de Recerca en Energia de Catalunya - IREC
Jardins dones de negre, 1 – 08930 – Sant Adrià de Besòs (Spain)
gbenveniste@irec.cat

⁽²⁾ Centro Técnico SEAT S.A. – Electrical development EE-S5 – PhD program
Autovía A2-km 585 – 08760 – Martorell (Spain)

⁽³⁾ Universitat Politècnica de Catalunya - Barcelona TECH
Carrer Colom, 11 – 08222 – Terrassa (Spain)

Keywords:

Electric Vehicle
Li-S battery
Specific Energy
Modelling
Electric Equivalent Circuit
Environmental assessment

Abstract:

The market share in electric vehicles (EV) is increasing. This trend is likely to continue due to the increased interest in reducing CO₂ emissions. The electric vehicle market evolution depends principally on the evolution of batteries capacity. As a consequence, automobile manufacturers focus their efforts on launching in the market EVs capable to compete with internal combustion engine vehicles (ICEV) in both performance and economic aspects. Although EVs are suitable for the day-to-day needs of the typical urban driver, their range is still lower than ICEV, because batteries are not able to store and supply enough energy to the vehicle and provide the same autonomy as ICEV.

EV use mostly Lithium-ion (Li-ion) batteries but this technology is reaching its theoretical limit (200-250 Wh/kg). Although the research to improve Li-ion batteries is very active, other researches began to investigate alternative electrochemical energy storage systems with higher energy density. At present, the most promising technology is the Lithium-Sulphur (Li-S) battery.

This paper presents a review of the state of art of Li-Sulphur battery on EVs compared to Li-ion ones, considering technical, modelling, environmental and economic aspects with the aim of depicting the challenges this technology has to overcome to substitute Li-ion in the near future. This study shows how the main drawbacks for Li-S concern are durability, self-discharge and battery modelling. However, from an environmental and economic point of view, Li-S technology presents many advantages over Li-ion.

Download English Version:

<https://daneshyari.com/en/article/7475186>

Download Persian Version:

<https://daneshyari.com/article/7475186>

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