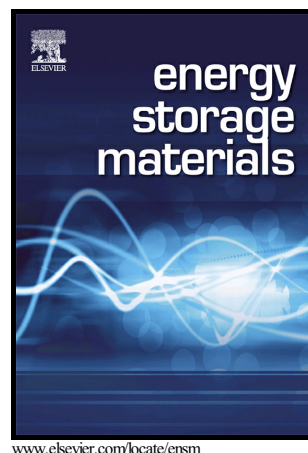


A Reversible Nonaqueous Room-temperature
Potassium-Sulfur Chemistry for Electrochemical
Energy Storage

Xingwen Yu, Arumugam Manthiram



PII: S2405-8297(18)30167-3
DOI: <https://doi.org/10.1016/j.ensm.2018.06.020>
Reference: ENSM430

To appear in: *Energy Storage Materials*

Received date: 14 February 2018
Revised date: 28 May 2018
Accepted date: 19 June 2018

Cite this article as: Xingwen Yu and Arumugam Manthiram, A Reversible Nonaqueous Room-temperature Potassium-Sulfur Chemistry for Electrochemical Energy Storage, *Energy Storage Materials*, <https://doi.org/10.1016/j.ensm.2018.06.020>

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 galley proof before it is published in its final citable 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.

A Reversible Nonaqueous Room-temperature Potassium-Sulfur Chemistry for Electrochemical Energy Storage

Xingwen Yu and Arumugam Manthiram^{*}

*Materials Science & Engineering Program and Texas Materials Institute, The University
of Texas at Austin, Austin, TX78712, United States*

^{*}Corresponding author: Tel: +1-512-471-1791; fax: +1-512-471-7681. *E-mail address:* manth@austin.utexas.edu (A. Manthiram)

ABSTRACT

Earth-abundant element potassium (K) exhibiting a low reduction potential and a high gravimetric capacity is an ideal anode material for the development of low-cost and high-energy batteries. We present herein a mechanistic study of a reversible room-temperature nonaqueous potassium-sulfur (K-S) chemistry and demonstrate a rechargeable K-S cell. Electrochemical and spectroscopic studies reveal that the discharge-charge of the K-S couple involves transition processes of potassium polysulfide species, resembling that of the lithium-sulfur chemistry. Through the design of a proper cathode-separator assembly, a deep discharge of the K-S cell with a high utilization of sulfur cathode is accessible.

Graphical abstract

Download English Version:

<https://daneshyari.com/en/article/7962604>

Download Persian Version:

<https://daneshyari.com/article/7962604>

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