

7-21-2021

Correction to "Lithium Bis(trimethylsilyl) Phosphate as a Novel Bifunctional Additive for High-Voltage LiNi_{0.5}Mn_{1.5}O₄/Graphite Lithium-Ion Batteries"

Jongjung Kim

Venkata A.K. Adiraju

Nuwanthi Rodrigo

Jennifer Hoffmann

Martin Payne

See next page for additional authors

Follow this and additional works at: https://digitalcommons.uri.edu/chm_facpubs

Creative Commons License



This work is licensed under a [Creative Commons Attribution-Noncommercial-No Derivative Works 4.0 License](#).

Citation/Publisher Attribution

Kim, Jongjung, Venkata A.K. Adiraju, Nuwanthi Rodrigo, Jennifer Hoffmann, Martin Payne, and Brett L. Lucht. "Correction to "Lithium Bis(trimethylsilyl) Phosphate as a Novel Bifunctional Additive for High-Voltage LiNi_{0.5}Mn_{1.5}O₄/Graphite Lithium-Ion Batteries"." *ACS Applied Materials and Interfaces* 13, 28 (2021): 33744. doi: [10.1021/acscami.1c11609](https://doi.org/10.1021/acscami.1c11609).

This Article is brought to you for free and open access by the Chemistry at DigitalCommons@URI. It has been accepted for inclusion in Chemistry Faculty Publications by an authorized administrator of DigitalCommons@URI. For more information, please contact digitalcommons@etal.uri.edu.

Authors

Jongjung Kim, Venkata A.K. Adiraju, Nuwanthi Rodrigo, Jennifer Hoffmann, Martin Payne, and Brett L. Lucht

Correction to “Lithium Bis(trimethylsilyl) Phosphate as a Novel Bifunctional Additive for High-Voltage $\text{LiNi}_{0.5}\text{Mn}_{1.5}\text{O}_4$ /Graphite Lithium-Ion Batteries”

Jongjung Kim, Venkata A. K. Adiraju, Nuwanthi Rodrigo, Jennifer Hoffmann, Martin Payne, and Brett L. Lucht*

ACS Appl. Mater. Interfaces 2021, 13 (19), 22351–22360. DOI: 10.1021/acsami.1c02572




Cite This: ACS Appl. Mater. Interfaces 2021, 13, 33744–33744



Read Online

ACCESS |

 Metrics & More

 Article Recommendations

In both the title and abstract the chemical formula for LNMO was incorrect. $\text{LiNi}_{1.5}\text{Mn}_{0.5}\text{O}_4$ should be corrected to $\text{LiNi}_{0.5}\text{Mn}_{1.5}\text{O}_4$. This is reflected in the title of this correction. The chemical formula in the text of the manuscript was correct so the change does not affect the results presented in the manuscript.

Abstract

The beneficial role of lithium bis(trimethylsilyl) phosphate (LiTMSP), which may act as a novel bifunctional additive for high-voltage $\text{LiNi}_{0.5}\text{Mn}_{1.5}\text{O}_4$ (LNMO)/graphite cells, has been investigated. LiTMSP is synthesized by heating tris(trimethylsilyl) phosphate with lithium *tert*-butoxide. The cycle performance of LNMO/graphite cells at 45 °C significantly improved upon incorporation of LiTMSP (0.5 wt %). Nuclear magnetic resonance analysis suggests that the trimethylsilyl (TMS) group in LiTMSP can react with hydrogen fluoride (HF), which is generated through the hydrolysis of lithium hexafluorophosphate (LiPF_6) by residual water in an electrolyte solution or water generated via oxidative electrolyte decomposition reactions to form TMS fluoride. Inhibition of HF leads to a decrease in the concentration of transition-metal ion dissolution (Ni and Mn) from the LNMO electrode, as determined by inductively coupled plasma mass spectrometry. In addition, the generation of the superior passivating surface film derived by LiTMSP on the graphite electrode, suppressing further electrolyte reductive decomposition as well as deterioration/re-formation caused by migrated transition metal ions, is supported by a combination of chronoamperometry, X-ray photoelectron spectroscopy, and field-emission scanning electron microscopy. Furthermore, a LiTMSP-derived surface film has better lithium ion conductivity with a decrease in resistance of the graphite electrode, as confirmed by electrochemical impedance spectroscopy, leading to improvement in the rate performance of LNMO/graphite cells. The HF-scavenging and film-forming effects of LiTMSPs are responsible for the less polarization of LNMO/graphite cells enabling improved cycle performance at 45 °C.

Published: July 9, 2021

