

# Correction to “Electrochemical Sodiation Mechanism in Magnetite Nanoparticle-Based Anodes: Understanding of Nanoionics-Based Sodium Ion Storage Behavior of $\text{Fe}_3\text{O}_4$ ”

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Article Recommendations

In the original version of the manuscript, there were some mistakes and omissions in the Advance Characterizations in page 50775. These changes have been suggested by our facility collaborator Dr. Christopher Pollock at the Center for High Energy X-ray Sciences (CHEXS) which is supported by the National Science Foundation under award DMR-1829070. We have been informed that these corrections are important for the funding agency. We declare that these changes do not alter major conclusions of the paper.

Please Replace the Second Paragraph of the Advance Characterization section (page 50775) with the following:

X-ray Emission Spectroscopy (XES) studies were carried out on the cycled anodes (samples A to H) to determine the occupation of  $\text{Fe}^{2+}$  and  $\text{Fe}^{3+}$  in  $\text{Fe}_3\text{O}_4$ , and the possible reaction pathway from the initial intercalation of  $\text{Na}^+$  ions into the inverse spinel structure of  $\text{Fe}_3\text{O}_4$  to the eventual conversion to metal NPs and sodium oxides (eq 1). Specifically, the cation configuration in  $\text{Fe}_3\text{O}_4$  and  $\text{Na}_x\text{Fe}_3\text{O}_4$  were characterized using XES for reliable information on cation oxidation states. This was accomplished by a site selective XES analysis by taking advantage of the spin, oxidation state, and ligand sensitive  $\text{K}\beta_{1,3} + \text{K}\beta_{2,5}$  spectra. All X-ray spectra were collected at the PIPOXS beamline at the Cornell High Energy Synchrotron Source (CHESS) under ring conditions of 100 mA at 6 GeV. The XES spectra were collected using five spherically bent analyzer crystals [Ge(620) for Fe  $\text{K}\beta$ ] arranged in a Rowland geometry and detected using a Pilatus 100 K area detector. The energy of the incident X-ray beam was tuned by means of a Si(111) double-crystal monochromator and was set to 7.7 keV. The beam size used was 200 (v)  $\times$  450 (h)  $\mu\text{m}$ . A pair of Rh-coated mirrors were used for focusing and harmonic rejection. To minimize the attenuation of the fluorescent radiation, the area between the spherical analyzers, detector, and sample was filled with helium gas. The emission spectra were collected with a step size of 0.30 eV. HERFD spectra were collected under the same conditions except that the analyzer crystals were set to the maximum of the  $\text{K}\beta_{1,3}$  emission line and the incident energy was scanned through the Fe K-edge in 0.25 eV steps. For all samples, each scan was collected on a fresh sample spot and were then averaged to obtain the final spectra for the sample.

In the original version of the manuscript, there were some omissions in the Acknowledgment section of the manuscript. Please Replace the Acknowledgment with the version below.

## ACKNOWLEDGMENTS

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