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Talk – Abstract and Title instructions

Presentation Title

Presenting author surname, first name • email address.

Presenter Surname, First name[1], collaborator or co-author surname, first name[2], *etc*

[1] University of Cambridge, Department of Chemistry.

[2] Affiliation, department, institute, etc

Main body of text
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References
1. *(insert single tab)* Reference text.
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Title, authors and affiliation(s) should be written in the style used above. Please follow the punctuation and name order exactly. Please include references (RSC Standard referencing) and/or acknowledgments at the end of the abstract.

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Graphite Anodes for Li-Ion Batteries: an Electron Paramagnetic Resonance Investigation

Materials Rig

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Graphite is a commercially successful anode for Li-ion batteries: its low cost, low toxicity and high abundance makes it ideally suited for batteries for devices, transportation and grid-based storage. The physical and electrochemical properties of graphite anodes have been thoroughly characterised, but one question remains unanswered—whether the electrons occupy localised states on Li or delocalised states on C, or an admixture therein. In this regard, electron paramagnetic resonance (EPR) spectroscopy is an invaluable tool for characterising the electronic states generated during electrochemical cycling. In this work, *ex situ* variable-temperature (10-300 K), variable-frequency (9-442 GHz) EPR was carried out to extract the *g*-tensors, linewidths, and metallicity of charged graphite at 4 different stages (from least to fully lithiated). We show that at high frequency (>300 GHz), the increased resolution offered by EPR enables up to three different axial environments to be observed, revealing heterogeneity within the graphite particles and the presence of hyperfine coupling to ^{7}Li.

Importantly, our work demonstrates the power of EPR spectroscopy in investigating the local electronic structure of graphite on cycling, paving the way for this technique as a tool for screening and investigating novel materials for use in lithium-ion batteries.